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MICRO PHOTO DIVISION

BELL & HOWELL

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PATENT OFFICE NOTICES

Certificates of Correction for the Week of May 4, 1971

Re. 26,749	3,531,885	3,544,966	3,551,425
Re. 27,016	3,532,756	3,545,520	3,551,835
D. 219,319	3,532,972	3,546,018	3,551,848
3,333,484	3,533,286	3,546,184	3,552,468
3,375,187	3,533,959	3,546,736	3,552,910
3,417,084	3,534,265	3,546,913	3,553,126
3,443,219	3,535,936	3,547,534	3,553,546
3,472,038	3,535,965	3,547,815	3,553,671
3,472,225	3,537,834	3,548,348	3,554,794
3,476,605	3,539,123	3,548,382	3,554,989
3,477,432	3,539,465	3,548,780	3,555,020
3,496,241	3,539,739	3,548,823	3,555,078
3,496,243	3,539,776	3,549,534	3,555,530
3,499,382	3,541,040	3,549,546	3,556,305
3,505,287	3,541,887	3,549,638	3,557,012
3,510,516	3,541,906	3,549,851	3,557,111
3,510,635	3,542,117	3,550,583	3,557,611
3,512,484	3,542,756	3,551,087	3,558,291
3,516,375	3,543,943	3,551,186	3,558,563
3,520,398	3,544,439	3,551,263	3,558,572
3,521,543	3,544,495	3,551,380	3,559,654
3,527,704	3,544,530	3,551,407	3,560,209
3,531,326	3,544,690	3,551,409	3,560,309

Service by Publication

Elmer J. Knize

In accordance with Rule 47 of the Rules of Practice of the United States Patent Office in Patent Cases, Notice is hereby given of the filing on June 16, 1969, of an application for patent entitled "Dispenser With Cup Supporting Bristles," on behalf of Elmer J. Knize, whose last known address is 4049 West 31st Street, Chicago, Illinois. The application was made in compliance with Rule 47(a) and 35 U.S.C. 116 by Howard W. Johnson and Giacinto C. D'Ercoli without execution by the said Elmer J. Knize.

Any action to be taken by the said Elmer J. Knize in connection with the said application must be taken within thirty days of the publication of this notice.

RICHARD A. WAHL,
Assistant Commissioner of Patents.

Patents Available for Licensing or Sale

3,191,513. FOLDING BELLOWS WITH INTERLOCKING CORNERS FOR PHOTOGRAPHIC DEVICES. Correspondence to: Central Trust Company Rochester N.Y., 44 Exchange St., Rochester, N.Y., 14614. Attn.: William K. Sjea, asst. vice pres.

3,389,561. METHOD OF AND APPARATUS FOR PROVIDING ANCHORS IN EARTH AND/OR ROCK FORMATIONS. Kenneth R. Taylor, P.O. Box 2185, Renton, Wash., 98055.

3,462,008. STORAGE AND HANDLING OF CHEMICAL SUBSTANCES. FEB, Limited, Manchester, England. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,519,250. STORAGE AND HANDLING OF CHEMICAL SUBSTANCES. FEB, Ltd., Manchester, England. Correspondence to: Michael S. Striker, 360 Lexington Ave., New York, N.Y., 10017.

3,535,667. ELECTRICAL SAFETY DEVICE. Henry C. Harnish, Jr., and Anthony J. Osello, Elcock Ave., Boonton, N.J. 07005.

3,549,035. FORK ASSIST. Donald W. Soper, Cross St., Orland, Maine, 04472.

3,552,388. BABY PATTING MACHINE. Thomas N. Zelenka, 205 S. Lemoore Ave., Lemoore, Calif., 93245.

3,557,999. PUSH-BUTTON SELF-OPENER CAN. Pedro Chagoyen, 81—07 25th Ave., Jackson Heights, N.Y., 11370.

3,559,305. GRADE AVERAGING DEVICE. Clyde S. Mundell, R.D. 1, Box 107, Carmichaels, Pa.

3,559,565. BARBEQUE GRILL. Clarence A. Getz, P.O. 316, Davenport, Wash., 99122.

3,559,339. COLLAPSIBLE PLANT STAKE ASSEMBLY. Robert W. Worley, 426 S. Clifton, Wichita, Kans., 67218.

3,560,015. COMBINED WHEEL AND PACK CARRIER. Lee J. Tracy, 629 8th St., Ogden, Utah, 84404.

3,560,047. FOLDABLE PORTABLE CHAIR WITH LIQUID DISPENSER. John Davis, 1200 La Cruz, El Paso, Tex., 79902.

3,563,159. ROTISSERIE. Martha Johnson, Huntington, W. Va. Correspondence to: Sherman Levy, Suite 602, Victor Bldg., 724 9th St. NW., Washington, D.C., 20001.

3,564,309. DATA STORAGE AND QUICK RETRIEVAL UNIT. Correspondence to: Sherman Levy, Suite 602 Victor Bldg., 724 9th St. NW., Washington, D.C., 20001.

The following 3 patents are offered by: John W. Barnd, 32 Gollybrook Road, Paramus, N.J.

3,351,128. MULTI-ZONE TEMPERATURE CONTROL.

3,496,991. FLUID TEMPERATURE REGULATING METHOD AND APPARATUS.

3,515,345. MULTI-ZONE TEMPERATURE CONTROL.

The following 4 patents are offered by: Joseph A. Vriend, P.O. Box 505, Squamish, British Columbia, Canada.

3,205,487. PORTABLE VISUAL SIGNAL DEVICE FOR GIVING VISUAL MORSE CODE SIGNALS.

3,361,487. PULSATING BRAKE.

3,415,334. HYDRAULIC DRIVE FOR MOTOR VEHICLES.

3,574,293. ANTI-KNOCK BEARING DEVICE.

General Electric Company is prepared to grant non-exclusive licenses under the following 10 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following patent may be addressed to: Patent Counsel, General Electric Company, Bldg. 1, Electronics Park, Syracuse, N.Y., 13201.

3,122,610. CIRCUITRY FOR MULTIPLEX TRANSMISSION OF FM STEREO SIGNALS WITH PILOT SIGNAL.

Applications for license under the following patent may be addressed to: Patent Counsel, Telecommunication Products Dept., General Electric Company, Lynchburg, Va., 24502.

3,197,167. MOUNTING CLIP FOR POT CORE.

Applications for license under the following 2 patents may be addressed to: Division Patent Counsel, Power Transmission Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa., 19142.

3,546,407. VACUUM-TYPE CIRCUIT INTERRUPTER.

3,555,354. ALTERNATING CURRENT CIRCUIT BREAKER HAVING A CONTROL FOR TIMING OPENING RELATIVE TO THE CURRENT WAVE.

Applications for license under the following 3 patents may be addressed to the Patent Counsel, Communication and Control Device Products Dept. General Electric Co., Waynesboro, Va., 22980.

3,346,874. POWER CONTROL CIRCUITS.

3,553,612. MINIATURE RELAY WITH DOUBLE AIR GAP MAGNETIC CIRCUIT.

3,554,338. TWO-DIRECTIONAL ROTATION CLUTCH ASSEMBLY.

Applications for license under the following 3 patents may be addressed to the Division Patent Counsel, General Electric Co., Space Division, P.O. Box 8555, Philadelphia, Pa., 19101.

3,549,436. LAYERED PROPELLANT COMPOSITION CONSISTING OF AN ELECTRICAL CONDUCTOR AND AN INSULATOR.

3,551,111. REACTION-EXTRACTION AND ANALYSIS CHAMBER AND RELATED EQUIPMENT.

3,554,669. ELECTRICFLUID ENERGY CONVERTER.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 20, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	12-01-69
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-22-69
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-04-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-26-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-03-69
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	8-17-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-01-69
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-02-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-03-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	1-05-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	6-03-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	1-23-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	12-10-69
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-02-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	5-07-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	1-06-70

Expiration of patents: The patents within the range of numbers indicated below expire during May 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 2,677,129 to 2,679,644, inclusive
Plant Patents ..... Numbers 1,274 to 1,281, inclusive

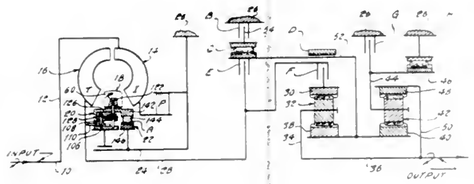
DEFENSIVE PUBLICATIONS

PUBLISHED MAY 4, 1971

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T886,001
HYDROKINETIC POWER TRANSMISSION SYSTEM WITH A SUBSTANTIALLY IDEAL FUNCTIONAL RELATIONSHIP BETWEEN OUTPUT SPEED AND TRACTIVE EFFORT
Martin G. Gabriel, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Continuation-in-part of application Ser. No. 518,853, Jan. 5, 1966. This application May 20, 1968, Ser. No. 738,368
Int. Cl. F16h *47/00*
U.S. Cl. 74—732
4 Sheets Drawing. 13 Pages Specification



This specification describes a hydrokinetic torque converter transmission having an increased low speed torque-ratio in geared portions of the mechanism and having a bladed stator of variable geometry in the torque convertor portion of the mechanism. The individual stator blades are mounted on rotatable stator blade shafts which can be rotated to effect angular adjustment of the stator blades by means of a rack-and-pinion servo. An increased degree of deflection of the toroidal fluid flow in the stator region of the circuit is obtained as the converter speed ratio increases thereby providing an overall torque ratio characteristic that approaches a theoretical, ideal performance.

T886,002
PREPARATION OF ORIENTED FOAM LAMINAR STRUCTURES
Leon Edward Wolinski, Buffalo, N.Y., and Roland G. Harris, Chadds Ford, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of application Ser. No. 848,206, Aug. 7, 1969. This application Sept. 26, 1969, Ser. No. 861,467
Int. Cl. C09j *5/00*
U.S. Cl. 156—311
No Drawing. 8 Pages Specification

Process for the preparation of film-foam laminar structures substantially free from warp which comprises maintaining the laminar structure in a flat configuration after lamination while cooling the structure below the distortion temperature of the foam. In a preferred embodiment the foam sheet is an oriented closed cell foam consisting essentially of styrene polymer. The preferred films are of polyvinyl chloride and polypropylene.

T886,003
GAUGE CONTROL OF FOAM STRUCTURES
Leon Edward Wolinski, Buffalo, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Sept. 26, 1969, Ser. No. 861,477
Int. Cl. B29d *27/00;* **B32b** *5/18;* **C08f** *7/04*
U.S. Cl. 264—51
No Drawing. 12 Pages Specification

Process for the treatment of thermoplastic closed cell foam structures by:

(a) Heating the structure to at least the second order transition temperature of the foam and below the temperature at which the foam undergoes cellular collapse,

(b) Compressing the foam structure to a thickness less than the nominal thickness of the foam structure and greater than the thickness determined according to the formula:

$$T=AB/C$$

wherein T is the desired minimum thickness, A is the density of the foam prior to treatment, B is initial nominal thickness of the foam, and C is the density of the unfoamed polymer, and

(c) Expanding the foam structure substantially free from restraint until the temperature of the foam structure is below the second order transition temperature.

T886,004
PURIFICATION OF DIPOTASSIUM TEREPHTHALATE
Erdem M. Atadan, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 4, 1969, Ser. No. 882,281
Int. Cl. C07c *51/42*
U.S. Cl. 260—525
No Drawing. 7 Pages Specification

Purified dipotassium terephthalate is recovered from crude aqueous dipotassium terephthalate solution containing potassium para-toluate as an impurity by crystallizing dipotassium terephthalate in an amount such that the weight ratio of potassium para-toluate to dipotassium terephthalate remaining in the aqueous solution does not exceed the potassium para-toluate to dipotassium terephthalate weight ratio at which potassium para-toluate will begin to crystallize, followed by separating the dipotassium terephthalate crystals from the aqueous solution, preferably by filtration. The crude aqueous solution of dipotassium terephthalate can be prepared either by dissolving crude terephthtalic acid in a potassium alkaline aqueous solution, e.g., aqueous potassium hydroxide, or directly from the oxidation of para-xylene or para-toluic acid in a potassium alkaline aqueous medium. The crystallization is conducted at about from 0° to 160° C., preferably about from 10 to 140° C., and at about from 0.1 to 10, preferably about from 0.5 to 4, atmospheres of total pressure. The dipotassium terephthalate can then be washed with any solvent which is chemically inert with respect to the dipotassium terephthalate, preferably a nearly saturated aqueous solution of dipotassium terephthalate, to displace any remaining mother liquor. Purified terephthalic acid can then be recovered by acidifying an aqueous solution of the purified dipotassium terephthalate.

T886,005
PRINTING INKS
Leon Edward Wolinski, Buffalo, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Dec. 17, 1969, Ser. No. 886,032
Int. Cl. C08h *9/00;* **C09d** *3/26, 11/06*
U.S. Cl. 106—27
No Drawing. 6 Pages Specification

A fast-drying printing ink useful in commercial lithographic printing and particularly useful in printing folded cartons and the like.

The ink comprises:

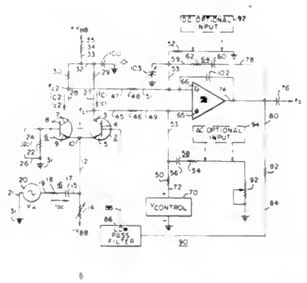
(A) a pigment;

(B) about 5–33 percent of an organic acid having from 8–20 carbon atoms and at least one set of conjugated double bonds such as an α or β form of oleostearic acid or a mixture of organic acids such as China oil;

(C) about 1.5–20 percent of a drying composition such as a solution of cobalt salts of aliphatic acids having from 4–40 carbon atoms, preferably C_8–C_{10} for an optimum balance of properties and particularly preferred is a 12 percent solution of a cobalt salt complex of a branched C_{10} aliphatic acid; and

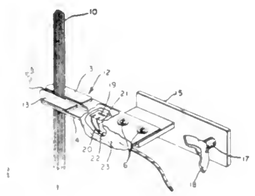
(D) up to about 30 percent plasticizer such as an ether phthalate selected from bis(2-ethoxyethyl) phthalate, bis(2-methoxyethyl) phthalate, butyl benzyl phthalate.

T886,006
LINEAR FOUR-QUADRANT MULTIPLIER
Daniel R. Nichols, 302 John Ave., Linthicum Heights, Md. 21090
Filed Apr. 15, 1970, Ser. No. 28,679
Int. Cl. G06g *7/12*
U.S. Cl. 307—229
2 Sheets Drawing. 16 Pages Specification



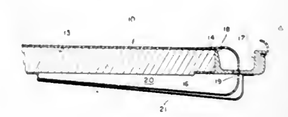
A circuit for multiplying two voltages together. The output is a voltage which is proportional to the product of the two voltages and whose sign is directly related to the signs of each of the input voltages. Even though nonlinear elements are used, such as transistors, the final output voltage varies linearly with each of the input voltages. An AC voltage (**2**) is an input to a high gain amplifier (**1**). A DC voltage (**70**) is an input to a high gain operational amplifier (**68**). The two amplifiers are interconnected by a DC bridge and an AC bridge. Initially, both bridges are balanced. A change in the DC voltage momentarily unbalances the output of the DC bridge. The high gain of the operational amplifier (**68**) provides a degenerative feedback voltage to control the multiplying amplifier (**1**) by rebalancing the DC bridge so that the overall output is a linear multiplication.

T886,007
APPARATUS FOR DETECTING OVERSIZE DEFECTS IN YARN
John Vipond Harvey, 36 Campbell Crescent; Bruce Alexander Robinson, 3 Holland Crescent; and John William Stassen, 155 Division St., all of Kingston, Ontario, Canada
Filed May 4, 1970, Ser. No. 34,167
Int. Cl. G01n *19/08*
U.S. Cl. 73—160
2 Sheets Drawing. 6 Pages Specification



A device for detecting oversize defects in yarns or filaments comprising a slotted flexible guide **12** having a strain gauge **19** mounted thereon. The yarns or filaments **10** are passed through the slot **11** and a defect in the yarns or filaments causes the guide to deflect a distance according to the size of the defect. The deflection produces a signal from the strain gauge which is fed to a discriminator that compares the magnitude of the signal with a preset level and eliminates signals from small defects. The device is particularly adaptable in solvent spinning of synthetic fibers for detecting oversize filaments, and polymer drips.

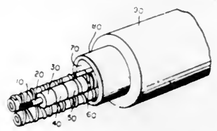
T886,008
DRAWING BOARD
James E. McConkey, 901 Elmgrove Road, Rochester, N.Y. 14624
Filed June 8, 1970, Ser. No. 44,462
Int. Cl. A47b *27/00, 63/04*
U.S. Cl. 312—23
1 Sheet Drawing. 6 Pages Specification



A drawing board is provided with a workface, an underface and a tray for holding drawing utensils or the like. The tray is arranged with respect to the workface so that a sheet of drawing paper supported on such workface, when overlapping an edge of the drawing board, will be partially disposed in such tray. A slot in the tray is of dimensions suitable for passage therethrough of the supported drawing sheet and communicates with a chamber located on the underface of the drawing board. Accordingly, a draftsman may remain seated at the drawing board and work on all areas of the supported sheet by feeding such sheet through the tray slot and into and out of the chamber.

T886,009
TRANSMISSION CABLES
David E. Hoiness, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed July 15, 1970, Ser. No. 55,030
Int. Cl. H01b *9/06*
U.S. Cl. 174—25
1 Sheet Drawing. 10 Pages Specification

A cable for the high voltage transmission of electrical power which is composed of a conductive wire wrapped with several layers of insulative and shielding materials. One such insulative material in an oil impregnated paper in which the oil is a cable oil and the paper is composed of a mixture of aromatic polyamide fibrids and fibers (e.g., fibrids and fibers of a wholly aromatic polyamide such as poly(meta-phenylene isophthalamide). The cables



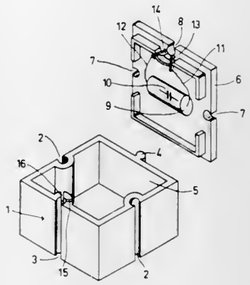
have low electrical loss properties due to the low dissipation loss factor and the good dielectric strength of the above-identified paper.

PATENTS

GRANTED MAY 4, 1971

ELECTRICAL

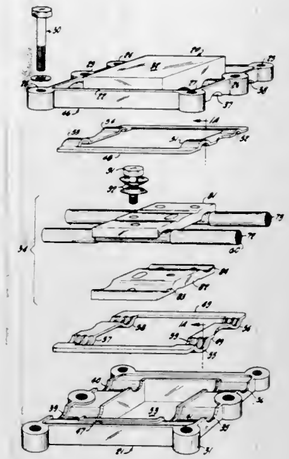
3,576,936
ASSEMBLY KIT
Artur Fischer, Grunmetterstr 133, Tumlingen, Germany
Filed Jan. 16, 1969, Ser. No. 791,748
Claims priority, application Germany, Jan. 24, 1968, P16 78 334.9
Int. Cl. G09b *23/18*
U.S. Cl. 35—19A **7 Claims**



An assembly kit has first structural elements and second structural elements the latter of which each are provided with an electrical component. Mating male and female coupling portions are provided on the first and second structural elements so that the same can be mechanically coupled. Conductor means conductively connects the electrical components with at least one predetermined coupling portion of the respective second structural element. Electrical connecting means is arranged to mate with the predetermined coupling portions of two of the second structural elements to thereby establish an electrical connection between the electrical components thereof.

3,576,937
UNDERGROUND RIGID CONNECTOR HOUSING SEAL
Raymond W. Eldridge, Jr., St. Louis, Mo., assignor to International Telephone & Telegraph Corporation, New York, N.Y.
Filed Dec. 26, 1968, Ser. No. 787,098
Int. Cl. H02g *15/08*
U.S. Cl. 174—92 **4 Claims**

An underground connector housing for large diameter power lines is enclosed within a split housing comprised of upper and lower Fiberglas reinforced plastic shells. These shells have entrance and exit ports for receiving the power cables which are connected together inside the housing. Gaskets seal the housing by following the contours of the mating surfaces on each shell of the Fiberglas housing. At the ports, the gaskets are increased slightly in thickness. Hence, the compression forces which occur when the two parts are bolted together, squeeze the gaskets together to force them

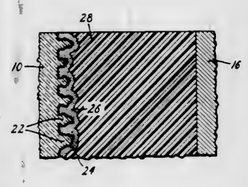


to expand and fill all of the available space within the housing parts and around the cables.

ERRATUM

For Class 174—128 see:
Patent No. 3,577,151

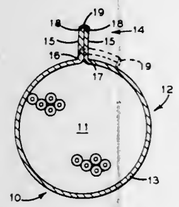
3,576,938
ELECTRICAL INSULATOR WITH POLYMER-CONTAINING JOINT BETWEEN THE PORCELAIN AND THE HARDWARE
Frank A. Capotosto, Newtown Square, Pa., and Robert V. Klint, Woodstown, N.J., assignors to General Electric Company
Filed Nov. 7, 1969, Ser. No. 874,853
Int. Cl. H01b *17/14, 17/38*
U.S. Cl. 174—196 **6 Claims**



Discloses an electrical insulator that comprises an improved joint for attaching the insulator hardware to the porcelain body of the insulator. The porcelain has a roughened surface, and the joint comprises a thin release coating of

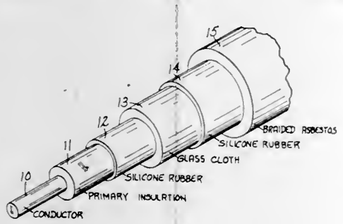
solid polymeric material on the roughened surface, a thicker coating of a polymer filled with a dry lubricant overlying the release coating but unbonded thereto, and a filled polymer in the space between the hardware and thicker coating that is bonded to both the thicker coating and the hardware. The release coating prevents the thicker coating from adhering to the roughened surface of the porcelain but is so thin that the thicker coating is still able to mechanically interlock with the roughened surface.

3,576,939
ELECTRICAL CABLES AND METHOD OF MAKING SAME
Gerhard Karl Ziemek, Hannover, Germany, assignor to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany
Filed Oct. 9, 1969, Ser. No. 864,984
Int. Cl. H01b *7/18*
U.S. Cl. 174—107 **10 Claims**



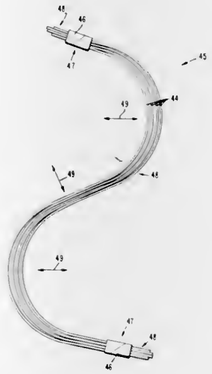
Electrical cables having an outer shielding element of thin metal tape; the tape being shaped into tubular form about the cable core and having a longitudinal seam; the seam having marginal tab portions integral with the tape and in face-to-face contact, the outer edges of the tab portions being metallically integrated to provide electrical conductivity continuously about the circumference thereof and to form a fluid-impervious envelope for the core which is resistant to mechanical stresses.

3,576,940
FLAME-RETARDANT WIRE AND CABLE
John G. Stone, North Haven; George S. Buettner, and Christian A. Alm, Cheshire, Conn., assignors to Cerro Corporation, New York, N.Y.
Filed Dec. 3, 1968, Ser. No. 780,644
Int. Cl. H01b *7/28*
U.S. Cl. 174—113 **19 Claims**



An electrical conductor or cable, capable of maintaining electrical integrity when exposed to open flame temperatures of 1000° F. without propagating a fire or resulting in falling burning particles or generating large volumes of smoke. The conductor or cable of this invention is comprised of a metallic conductor or plurality of conductors covered by a layer of primary insulation. Such conductors are then covered by a layer of silicone rubber which is, in turn, covered by a layer of glass fiber. The layer of glass fiber may then be covered by another layer of silicone rubber which is, in turn, covered by a layer of braided asbestos impregnated with an intumescent material. In the alternative, the second layer of silicone rubber may be covered by an asbestos tape which is then covered by a layer of elastomeric material having fire-retardant properties.

3,576,941
FLAT POWER-DISTRIBUTION CABLE
Donald F. Colglazier, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of application Ser. No. 696,595, Jan. 9, 1968, now abandoned. This application Aug. 6, 1969, Ser. No. 847,937
Int. Cl. H01b *7/08*
U.S. Cl. 174—117 **15 Claims**

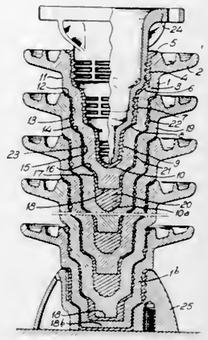


A flat cable for distributing electrical power between hingeable or demountable pieces of electrical apparatus is made up of thin, flat conductors nonrigidly mounted one on top of the other. The nonrigid mounting of the conductors relative to each other permits one to slip or slide relative to the other and thereby improve flexure of the cable and also increase the number of flexures the cable can be cycled through before it fails. Nonrigid mounting can be achieved by several different configurations. First, each flat conductor can be provided with its separate insulating layer and then the two insulated conductors may be held one over the other loosely so that they may slide or slip relative to each other. Second, a flat insulating cable may have a partition across its width so that one flat conductor may be placed in one partitioned section and the other flat conductor may be placed under the other conductor in the second partitioned section. Third, separately insulated conductors may be taped together at spaced locations so as to allow each conductor to slide within its own insulation and to allow relative movement of the conductors between the spaced locations.

3,576,942
ELECTRIC INSULATORS WITH SPIGOTING ELEMENTS
Thomas Caldor, Saint-Yorre, Allier, France, assignor to Societe Sediver, Societe Europeenne d'Isolateurs en Verre, Paris, France
Filed May 20, 1969, Ser. No. 826,244
Claims priority, application France, May 22, 1968, 152,792
Int. Cl. H01b *17/14, 17/66, 19/00*
U.S. Cl. 174—210 **6 Claims**

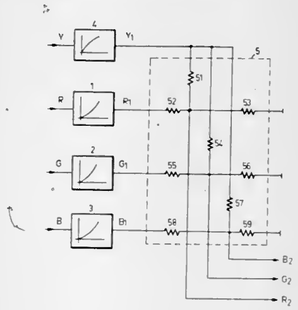
A method and apparatus for developing a column, which column comprises a plurality of substantially conical elements supporting one another in a spigoting arrangement, one seated in the other. The elements are connected to one another by a substance such as mortar. The walls of the elements are shaped such that when mortar is introduced in a

controlled manner into one of the elements, there is a controlled discharge of the temporarily fluidized mortar along



the ducts of prescribed contour constituted by the opposing wall surfaces of an adjacent interfitted element.

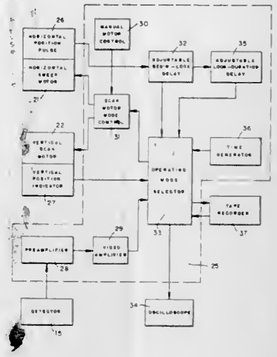
3,576,943
COLOR TELEVISION MIXING ARRANGEMENT
Hans-Dieter Schneider, Gross-Gerau, Germany, assignor to Fernseh G.m.b.H., Darmstadt, Germany
Filed Aug. 30, 1968, Ser. No. 756,671
Claims priority, application Germany, Aug. 31, 1967, P 15 37 117.2
Int. Cl. H04n *9/32*
U.S. Cl. 178—5.4 **8 Claims**



An arrangement in the transmission of color television. Color component signals are applied to amplifiers which, in turn, provide outputs mixed with the luminance signal component. The mixing is performed in a network of summing resistors. Each of the color component signals is mixed with a luminance signal component such that the latter has an amplitude which varies inversely with the amplitude of the luminance signal.

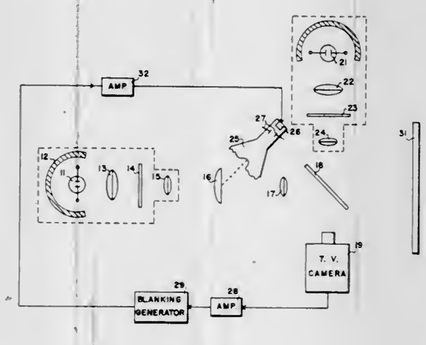
3,576,944
SCANNING RADIOMETER WITH PLURAL REFERENCE SOURCES
Kenneth B. LaBaw, China Lake, Calif., assignor to the United States of America as represented by the Secretary of the Navy
Filed Jan. 28, 1969, Ser. No. 794,512
Int. Cl. G01j *5/52;* **H04n** *3/08, 7/18*
U.S. Cl. 178—6.8 **10 Claims**

A scanning radiometer for producing long wave length infrared photographs and radiometric measurements. The instrument provides a raster type area scan by varying the horizontal and vertical field-of-view of the instrument. A detector produces a video signal which can be displayed on an



oscilloscope and recorded with a camera to produce an area scanned picture.

3,576,945
APPARATUS FOR OPTICALLY INSETTING ONE IMAGE INTO ANOTHER IMAGE
William C. Ebeling, Binghamton, N.Y., assignor to Singer-General Precision, Inc., Binghamton, N.Y.
Filed Mar. 24, 1969, Ser. No. 809,732
Int. Cl. H04n *1/38, 5/24*
U.S. Cl. 178—6.8 **7 Claims**



Apparatus is provided for insetting one image optically into a portion of another image. The apparatus includes two separate image generation and projection systems. A beam splitter combines the two images for projection onto a single viewing screen. One image projection system includes a field lens having one surface comprising an electroplastic film. A cathode ray is caused to sweep those portions of the film which represent the portion to be insetted by the other image. A TV camera system controls the generation of the cathode beam in response to an image projected through the beam splitter onto the TV camera. The portions of the film struck by the beam effectively occult corresponding portions of one image. The other image occupies the occulted portion.

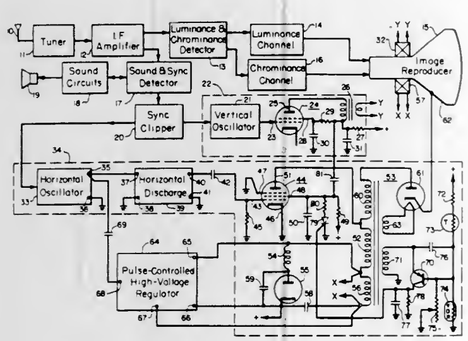
ERRATUM

For Class 178—7.1 see:
Patent No. 3,577,200

3,576,946
POWER SUPPLY PROTECTION CIRCUIT UTILIZING A SILICON CONTROLLED RECTIFIER

Kenneth Frizane, Elmwood Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 3, 1969, Ser. No. 788,858
Int. Cl. H04n *5/44*
U.S. Cl. 178—7.3 **4 Claims**



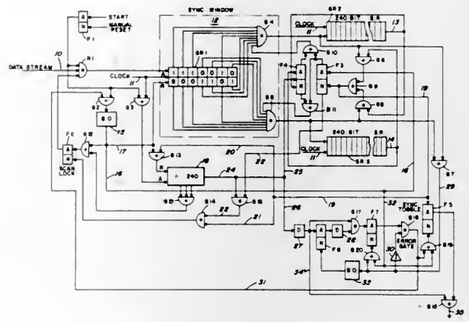
A control circuit for preventing the application of accelerating potential in excess of a predetermined maximum value to the cathode-ray picture tube of a television receiver. Positive polarity pulses amplitude-related to the applied accelerating potential are derived from the receiver horizontal deflection system and impressed across the emitter-base junction of a transistor. The base of this transistor is biased at a DC level such that the impressed pulses will exceed the breakdown potential of the junction when the accelerating potential exceeds its maximum value. When this occurs a control voltage is applied by the transistor to the control electrode of a silicon controlled rectifier (SCR) which has principal electrodes connected between the screen of the horizontal deflection system output tube and ground. This causes the SCR to conduct, substantially reducing the screen current applied to the output tube and hence the energy available for powering the receiver's sweep-excited high voltage power supply, and preventing further generation of excessive accelerating potential. To prevent the receiver from being rendered inoperative by a transient overload condition, a capacitor couples pulses from the output circuit of the receiver vertical deflection system to the screen of the horizontal output tube to periodically reduce the quiescent current through the principal electrodes following an overvoltage condition to a value below the minimum holding current required to sustain conduction, thereby restoring the SCR to a nonconductive state and the high voltage power supply to an operative state. During a sustained overvoltage condition the control circuit causes the receiver to alternate between operative and nonoperative states, which "blinking" action on the receiver viewing screen effectively indicates a malfunction.

3,576,947
RAPID FRAME SYNCHRONISM OF SERIAL BINARY DATA

Lawrence W. Kruger, Newbury Park, Calif., assignor to the United States of America as represented by the Secretary of the Navy

Filed Jan. 16, 1969, Ser. No. 791,685
Int. Cl. H04n *1/32*
U.S. Cl. 178—69.5 **7 Claims**

A circuit means of detecting the synchronizing word in not more than two frames of serial binary information data having the serial data clocked through a shift register sync window and alternate gates for the sync word and its complement to a pair of frame bit shift registers to store the serial data for comparing consecutive frames for the sync word and its complement to produce an output signal after two consecutive frames of input data, any miss of sync word detec-



tion in two frames causing circuit switching to reset the circuit means for subsequent detection of the sync word.

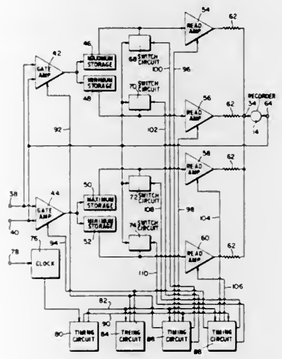
ERRATUM

For Class 179—2 see:
Patent No. 3,577,201

3,576,948
SYSTEM FOR RECORDING HIGH FREQUENCY SIGNALS ON A RECORDER HAVING A LOWER FREQUENCY RESPONSE

Norman L. Stauffer, Englewood, Colo., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed June 10, 1968, Ser. No. 735,723
Int. Cl. H04b *1/66*
U.S. Cl. 179—15.55 **6 Claims**



A device is disclosed for recording high frequency signals on a lower frequency recorder. In accomplishing this, the high frequency signals are amplified and periodically stored in maximum and minimum storage devices. The stored maximum and minimum values of the high frequency signal are then sequentially applied through read amplifying circuitry to the lower frequency recorder which displays the signal retaining the amplitude thereof.

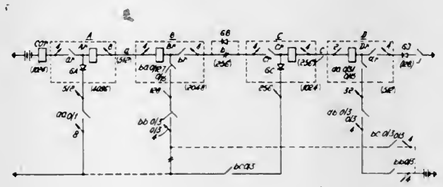
ERRATUM

For Class 179—15 see:
Patent No. 3,577,202

3,576,949
MULTISTAGE SWITCHING NETWORK EMPLOYING CASCADED THREE-TERMINAL CROSSPOINTS

Frans Corneel Leo DeWit, Mortsel, Belgium, and Hans Helmut Adelaar, Kapellenbos, Belgium, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 18, 1968, Ser. No. 698,796
Claims priority, application Netherlands, Jan. 23, 1967, 6,701,051
Int. Cl. H04q *3/48*
U.S. Cl. 179—18 **7 Claims**

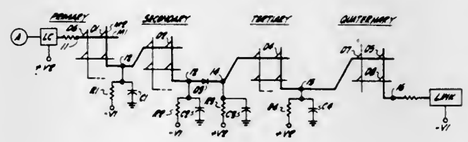


A multistage relay crosspoint network is disclosed in which a connection is held operated through the windings of the relays, each in series with its make contact. In a four-stage connection the hold contacts of the 1st and 2nd as well as those of the 3rd and 4th stages are serially connected and such hold connections replace similar parallel ones involving marking contacts. The invention substantially reduces the number of marking relays needed to establish connections by having the windings of the 1st and 2nd as well as those of the 3rd and 4th stages on the same side and by selecting, through access relay contacts, the desired crosspoints in the 1st and 3rd stages while marking rectifiers are used in the 2nd and 4th to enable bundles of marking wires to be selected in these stages in order to operate the desired crosspoints in these stages also.

3,576,950
SELF-SEEKING ELECTRONIC SWITCHING NETWORK

Nikola Ljotic Jovic, Chicago, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 29, 1968, Ser. No. 771,453
Int. Cl. H04q *3/50*
U.S. Cl. 179—18 **10 Claims**

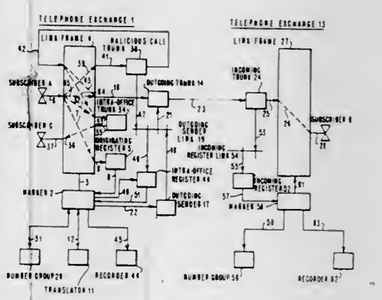


Primarily, this electronic switching network is used to enable the construction and operation of truly large scale networks without sacrificing the desirable aspects of self-seeking principles. In greater detail, a self-seeking current controlled network of PNPN diodes (or similar devices) is divided, by general purpose diodes, into a plurality of electrically isolated section. The isolation sets inherent limits on offensive fan-out currents and crosstalk, and it enables self-imposed node point priming. This is done by firing crosspoints at naturally occurring oscillation frequencies which inherently speedup as the self-selection process approaches the successful completion of a latched path. Initially the oscillation is at the naturally occuring cyclic firing frequencies of the end-marked diodes at either ends of the paths. At speedup, the oscillation becomes the entire path leaping back and forth between the end-marked points. Finally, the path selection process is completed when current flows over a completed path.

3,576,951
CALLING SUBSCRIBER IDENTIFICATION SYSTEM

Tomomi Uchida; Takeshi Kondo, Tokyo-to; Hiroshi Takada, Kawasaki-shi; Hiroaki Eguchi, Tokyo, and Kenichi Hasegawa, Yokohama-shi, Japan, assignors to Nippon Electric Company, Limited, Tokyo-to, Japan and Fusitsu Limited, Kawasaki, Japan, fractional part interest to each

Filed Dec. 4, 1968, Ser. No. 781,048
Claims priority, application Japan, Dec. 9, 1967, 42/78280
Int. Cl. H04m *3/42*
U.S. Cl. 179—18 **2 Claims**

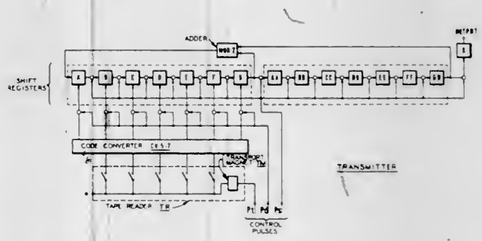


A calling subscriber identification system in an automatic telephone exchange system determines the telephone number of a calling subscriber upon the calling subscriber making a telephone call to a called subscriber. The telephone number of the called subscriber is determined. Subscriber-determining apparatus determines if the called subscriber is a specific subscriber in accordance with the telephone number of the called subscriber. A recorder records the telephone number of the calling subscriber when the subscriber determining means determines that a telephone connection is made between the calling subscriber and the specific subscriber as the called subscriber. Calling subscriber identifying apparatus determines and indicates from the recorder the telephone number of the calling subscriber upon a command signal from the called subscriber. The command signal is produced and transmitted to the calling subscriber identifying apparatus under the control of the called subscriber.

3,576,952
FORWARD ERROR CORRECTING CODE TELECOMMUNICATING SYSTEM

Hendrik Cornelis Anthony Van Duuren, Wassenaar, Voorburg, Netherlands, assignor to and De Staat Der Nederlanden, Ten Deze Vertegenwoordigd Door De Directeur, The Hague, Netherlands

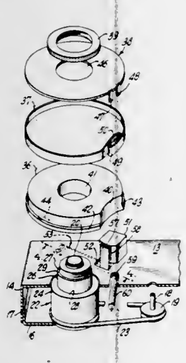
Filed Jan. 6, 1969, Ser. No. 789,340
Claims priority, application Netherlands, Jan. 19, 1968, 6800871
Int. Cl. H04l *1/10*
U.S. Cl. 178—23.1 **11 Claims**



A multielement code telecommunication system comprising first converting each code signal into a constant ratio 1-bit/0-bit signal, storing a predetermined successive number of such converted code signals in shift registers to form a group,

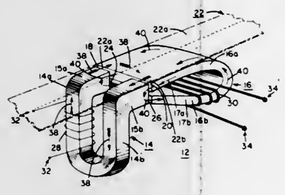
and forming a test signal by modulo 2 adding the bits in said group of signals which test signal is transmitted with and after each said group to form a block of signals; receiving and storing in shift registers each signal in said group, testing each signal as it is received and if one and only one signal in said group is found mutilated or erroneous, clearing the shift register in which that erroneous signal is stored and reconstructing therein the correct signal from said test signal and the other correctly received signals in that group; and lastly reconverting said correct group of signals and transferring them from printing registers successively to a printer.

3,576,953
MAGNETIC TAPE INFORMATION STORAGE DEVICE
Werner Hauer, Sayre, Pa., assignor to Neo Dynamics, Inc., Irvington, N.J.
Filed July 3, 1968, Ser. No. 742,226
Int. Cl. G11b *5/76, 25/02*
U.S. Cl. 179—100.2 **7 Claims**



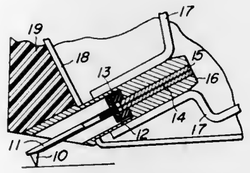
An information storage device includes a rotatable drum having an anchoring element spaced from the periphery thereof. A magnetic recording tape extends around the periphery of the drum and has a tail engaging the anchoring element to provide a free path between the tape and the drum periphery for the reception of a spring biased member which urges the tape into sliding engagement with the opposing face of a magnetic transducer. In one form the drum is provided with a separable end plate provided with a pair of closely peripherally spaced longitudinal legs, and the tape is in the form of an endless ring looped about the leading and trailing edges of respective legs.

3,576,954
METHOD OF LOW POWER BIAS, LOW DISTORTION MAGNETIC RECORDING
Edward C. Sand, Willoughby, Ohio, assignor to Clevite Corporation
Filed Sept. 16, 1968, Ser. No. 759,842
Int. Cl. G11b *5/02, 5/44*
U.S. Cl. 179—100.2 **5 Claims**



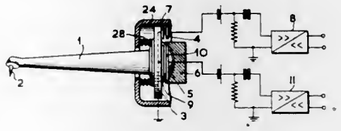
A method of magnetic recording is provided which utilizes an AC signal flux recorded in conjunction with DC bias flux which biases the magnetic tape to the knee portion of the remanent magnetization characteristic of the magnetic record medium. By using two tracks in the same medium and suitable distribution of signals, the method provides low distortion overall although each individual track is severely distorted.

3,576,955
ARMATURE ASSEMBLY FOR MAGNETIC-TYPE PHONOGRAPH PICKUP
Shuichi Obata, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Oaza Kadoma, Kadoma-shi, Osaka, Japan
Filed Aug. 16, 1968, Ser. No. 753,236
Claims priority, application Japan, Aug. 22, 1967, Aug. 22, 1967, 42/72682; 42/72683
Int. Cl. H04r *11/12*
U.S. Cl. 179—100.41M **3 Claims**



An armature assembly for a magnetic-type phonograph pickup having a cord or wire which supports a stylus arm with a magnet mounted thereon, the armature, being supported by the aid of the bending of the cord or wire at one stable point to vibrate uniformly in every direction at that point; and a bearing member of elastic material the compression of which can be adjusted so that at the peak the resonant frequency of the output voltage can be damped, such that the frequency response characteristic of the output voltage can be flattened.

3,576,956
STEREOPHONIC PHONOGRAPH TRANSDUCER
Cornelis Lanooy, and Herbert Mensen, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed May 20, 1959, Ser. No. 814,556
Claims priority, application Netherlands, June 20, 1958, 228,905
Int. Cl. H04r *11/12, 19/10*
U.S. Cl. 179—100.41 **6 Claims**

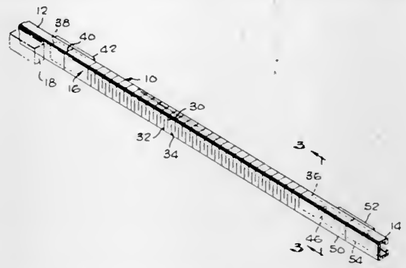


A phonograph pickup, particularly for stereophonic recording and reproduction in which a body for converting movements of a stylus is suspended within a housing to be tiltable in all directions.

3,576,957
PANTOGRAPHS
Arnold Tustin, Tring, England, assignor to British Railways Board, London, England
Filed Feb. 6, 1969, Ser. No. 797,028
Int. Cl. B60l *5/08*
U.S. Cl. 191—60.3 **11 Claims**

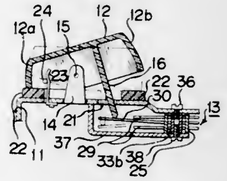
This invention provides an arrangement for the supply of electric current to vehicles, which includes a servosystem providing compensation for inertial forces so as to maintain a

contact member in electrically conductive connection with a conductor extending along the length of a track along which a vehicle runs. The servosystem includes a slug whose inertia is utilized to effect variation of the pressure of a fluid acting



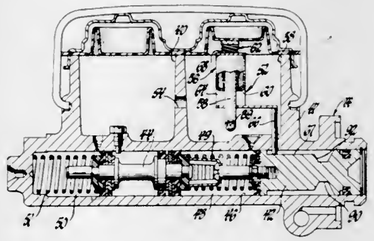
on a piston in a cylinder so as to cause the pressure of such fluid on said piston to vary in a manner which includes a component proportional to upward and downward accelerations of the contact member and in the same sense.

3,576,958
SWITCHING DEVICE WITH IMPROVED TABLET ACTUATOR MEANS
Junji Ohno, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan
Filed Feb. 27, 1969, Ser. No. 802,368
Claims priority, application Japan, Apr. 13, 1968, Apr. 17, 1968, Apr. 19, 1968, 43/29886;43/30983;43/31689
Int. Cl. H01h *9/00*
U.S. Cl. 200—1 **9 Claims**



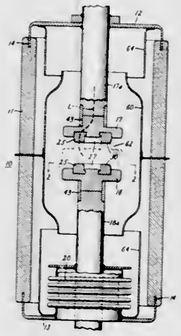
The switching device of a tablet type comprises a plurality of tablets each having bosses formed integrally on the surfaces of its sidewalls coaxially with bores formed in the tablets to receive an axis. The tablets are arranged on a base by passing the axis through said bores in such a manner that the bosses formed on two adjacent tablets face each other.

3,576,959
BRAKE WARNING SWITCH
John P. Bogosoff, Battle Creek, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Nov. 4, 1969, Ser. No. 873,843
Int. Cl. H01h *35/18*
U.S. Cl. 200—84 **8 Claims**



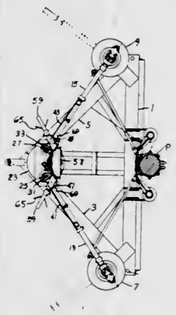
A vehicle brake system master cylinder assembly is provided with a switch assembly employing a float to monitor both fluid level in a reservoir and excessive travel of a fluid-pressurizing piston. The float itself responds to the fluid level and an upper float travel limit is established in accordance with the piston position.

3,576,960
FLANGE FASTENING MEANS FOR A CONTACT BUTTON FOR A VACUUM-TYPE CIRCUIT INTERRUPTER
Donald R. Kurtz, Malvern, Pa., assignor to General Electric Company
Filed Mar. 8, 1968, Ser. No. 711,759
Int. Cl. H01h *33/66*
U.S. Cl. 200—144 **4 Claims**



Contact structure for a vacuum-type circuit interrupter comprising a contact containing an annular groove surrounding an integral central boss. An annular contact-making button is fitted in the groove and is secured in place by deforming the outer periphery of the boss to define an integral lip extending radially outwardly from the boss, overlapping a radially inwardly projecting shoulder on the button, and tightly sandwiching the shoulder against the bottom of the groove.

3,576,961
VACUUM SWITCH WITH OPERATING MEANS FOR ARRESTING CONTACT IN AN INTERMEDIATE POSITION BEFORE COMPLETE OPENING
John L. Turner, East St. Louis, Ill., assignor to Turner Electric Corporation, East St. Louis, Ill.
Filed Aug. 2, 1968, Ser. No. 749,719
Int. Cl. H01h *33/66, 3/52*
U.S. Cl. 200—144 **11 Claims**



Mechanism for operating a load interrupter switch responsive to opening and closing movements of an air break switch or a plurality of the latter. The load interrupter switch contacts are enclosed in a vacuum bottle preferably, one contact being fixed and the other movable axially away therefrom to

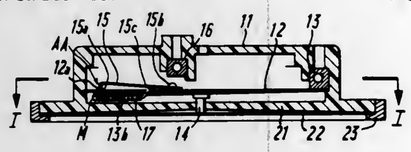
open position and toward the fixed contact to closed position. The movable contact is biased toward open position and is normally held in closed position by a lever pivoted at one end and extending transversely of the direction of movement of the contact. The lever is normally maintained in the contact-closed position by a rotatable cam. A latch member extending transversely of the lever normally overlies one end of the lever and when the cam is rotated to permit initial movement of the lever the end of the latch becomes engaged with the end of the lever, permitting a slight initial opening movement of the lever and the associated contact for a period of two to three cycles. Further movement of the cam causes another projection on it to engage the latch, keeping it clear of the end of the lever and permitting the lever to move freely, thus freeing the contact to move under spring pressure to its full open position. This sequential opening of the contact permits harmless arcing to occur across the contacts within the vacuum bottles during initial opening of the contacts until the current reaches its zero value, thus avoiding interruption of the current at other than zero values and the consequent occurrence of high transient voltages.

ERRATUM

For Class 200—151 see:
Patent No. 3,576,967

3,576,962
PUSH CONTACT DEVICE

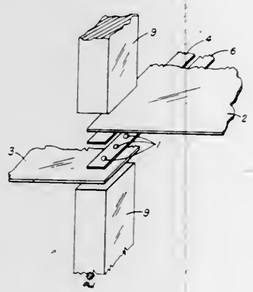
Jean-Pierre Edmond Nicolas, Nice, France, assignor to Legrand, Limoges, France
Filed Dec. 5, 1968, Ser. No. 781,408
Claims priority, application France, Dec. 13, 1967, 132,124
Int. Cl. H01h *9/18, 3/12*
U.S. Cl. 200—167 **9 Claims**



A push contact device having a small control travel intended for controlling electrical apparatus by current impulses. An operating pushrod projects freely from the center of a concave baseplate by a deformable operating plate against which the said pushrod is supported.

3,576,963
WELDING METHOD

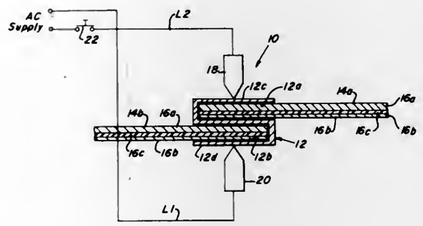
Freeman M. Vowels, Louisville, Ky., assignor to American Air Filter Company, Inc., Louisville, Ky.
Filed Sept. 3, 1968, Ser. No. 757,169
Int. Cl. B23k *11/10*
U.S. Cl. 219—92 **4 Claims**



A method of resistance welding electrically conductive bodies together wherein projection means and sealing means are positioned between overlapped portions of such bodies, the bodies then being subjected to pressure and current to seal and weld the bodies together.

3,576,964
WELDED JOINT

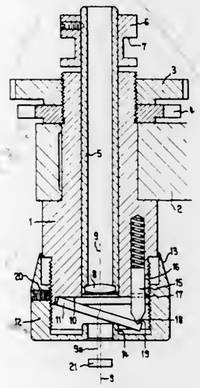
Alvin R. Williams, Northfield, Ohio, assignor to United States Steel Corporation
Filed May 27, 1969, Ser. No. 828,296
Int. Cl. B23k *11/10*
U.S. Cl. 219—92 **7 Claims**



A welded joint is disclosed having an S-shaped metal connector provided with a first laminate cavity and a second laminate cavity, a first adhesively bonded laminate disposed in the first laminate cavity, and a second adhesively bonded laminate disposed in the second laminate cavity. The first adhesively bonded laminate and the second adhesively bonded laminate, each has a first metal member, a second metal member and an electrically insulating adhesive between the first metal member and the second metal member. The first adhesively bonded laminate and the second adhesively bonded laminate are disposed in the first laminate cavity and the second laminate cavity respectively so that the first metal members and the second metal members are in contact with the metal connector and are welded together.

3,576,965
METHOD AND DEVICE FOR BORING WORKPIECES, PARTICULARLY WATCH JEWELS BY MEANS OF LASER PULSES

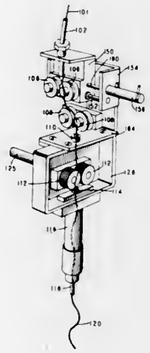
Gottfried Gugger, Steffisburg, Switzerland, assignor to Laser Technique SA., Bern, Switzerland
Filed Sept. 13, 1968, Ser. No. 759,664
Claims priority, application Switzerland, Sept. 25, 1967, 13357/67
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 **26 Claims**



A method and device for producing bores of substantially circular cross section in workpieces, particularly in watch jewels, by means of laser pulses, wherein a number of laser pulses successively produced by a laser source are directed into an optical deflecting system wherein the laser beam is deflected from its axis of incidence, successive laser pulses being thereby distributed by said rotating deflecting system on a path round the axis of the bore to be produced.

3,576,966
ARC-WELDING IN NARROW GAP

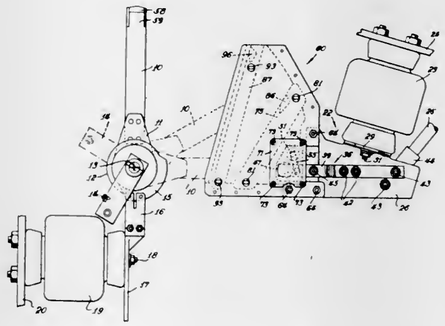
Cornelius J. Sullivan, Berkeley Heights, N.J., assignor to Air Reduction Company, Incorporated, New York, N.Y.
Filed Mar. 27, 1967, Ser. No. 626,026
Int. Cl. B23k *9/12*
U.S. Cl. 219—137 **2 Claims**



A welding wire of serpentine form is fed into an electric arc in a narrow gap between workpieces to be joined, the wire passing through a contact tube which is sheathed in electrical insulation to avoid short-circuiting to the workpieces, the serpentine form of the wire serving to direct the arc toward one side of the gap or the other in periodic oscillations as the electrode is moved lengthwise of the gap from one end to the other, and the seam is built up layer by layer in repeated passes of the electrode. Means are shown for bending the wire to the desired form.

3,576,967
SWITCH CONSTRUCTION WITH LOAD BREAK DEVICE HAVING ONE OR MORE MOVABLE SLATS WITH HEAT SPACERS

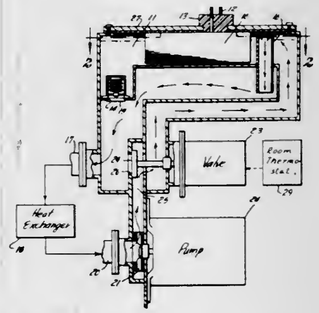
James E. Jeffries, Chicago, Ill., assignor to S & C Electric Company, Chicago, Ill.
Filed Apr. 4, 1969, Ser. No. 813,541
Int. Cl. H01h *33/06*
U.S. Cl. 200—151 **6 Claims**



A rotatable switch blade engages and disengages stationary contact assembly through a slot in a generally sector-shaped insulating housing enclosing the contact assembly and formed by either a pair of stationary plates or by a single molded piece of plastic arc extinguishing material. The housing has one or more generally radially extending slats of plastic arc extinguishing material which are located in a groove or grooves on one side of the slot and are biased transversely into a registering groove or grooves on the other side of the slot. The distal end of the switch blade successively engages the outer ends of the slats and displaces them transversely of the slot as the switch blade rotates toward the switch closed position. The reverse procedure occurs when the switch blade rotates toward the switch open position accompanied by arc confining and extinguishing action of the slat or slats and the housing.

3,576,968
ELECTRODE HEATING SYSTEM

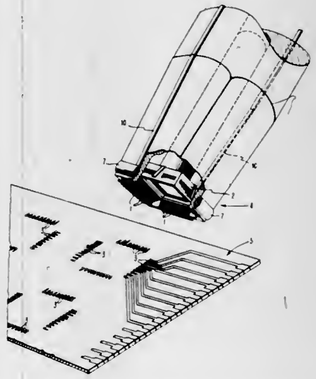
Robert L. Collie, Orange County (2707 Catalina Drive) Orlando, Fla.
Filed May 19, 1969, Ser. No. 825,556
Int. Cl. H05b *3/60;* **F28d** *15/00*
U.S. Cl. 219—284 **10 Claims**



An electrode heating apparatus for controlling the heat output in an electric heating system by varying the level of an electrolyte solution in a heating chamber having electrodes therein. A heat exchanger is connected to the heating chamber for utilizing heat generated in the electrolyte solution and provision is made for a quick heat up of the electrolyte solution. Thermostatic valves control the flow of the electrolyte solution into and out of the heating chamber and thus the level of the electrolyte in the chamber which in turn determines the rate of heating of the electrolyte solution by the area of the electrodes covered by the electrolyte solution.

3,576,969
SOLDER REFLOW DEVICE

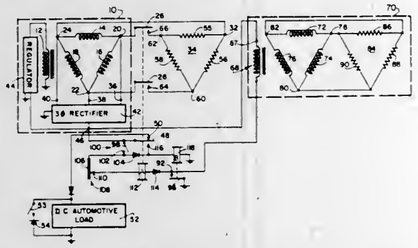
Rohinton J. Surty, Redwood City, Calif., and Conrad Trollmann, Baden Wurttemberg, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 2, 1969, Ser. No. 854,396
Int. Cl. B23k *3/02;* **H05b** *3/10*
U.S. Cl. 219—221 **1 Claim**



Disclosed is a device for simultaneously soldering numerous integrated circuit chip leads to a circuit board. The

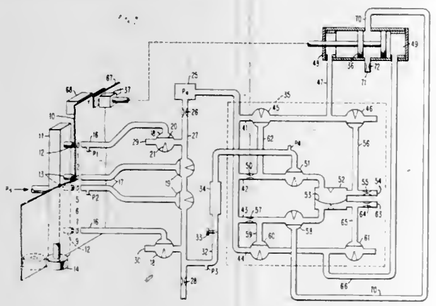
device is characterized by having a heating tip made of refractory, electrically insulative, thermally conductive, material. Fused to this tip is a coat of penetrating metallic paste. The paste is disposed on the tip in an electrically continuous path. Heating is accomplished by passing current through this metallic paste path.

3,576,970
QUICK HEAT AND ELECTRICAL POWER-PRODUCING SYSTEM
James R. Cherry, Barrington, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Oct. 1, 1969, Ser. No. 862,785
Int. Cl. F27d *11/00*
U.S. Cl. 219—279 **6 Claims**



A system for producing either quick heat or electrical power, or both, for automobiles comprises a conventional alternator, an auxiliary alternator and a control system therefor. In the quick-heat mode the control system connects the field winding of the auxiliary alternator to load the output of the conventional alternator thereby avoiding the generation of voltage transients. If quick heat is not desired, the conventional alternator provides only electrical power and the auxiliary alternator has no output.

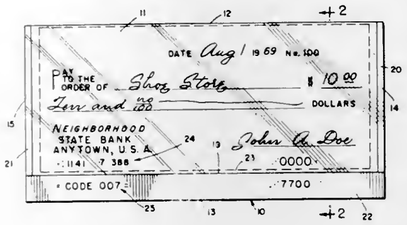
3,576,971
FLUID-ACTUATED TRANSLATING APPARATUS
Richard E. Norwood, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 8, 1967, Ser. No. 644,584
Int. Cl. G06k *7/02*
U.S. Cl. 235—61.11 **6 Claims**



Punched card interpreter using fluid jets for sensing the presence of holes and controlling diaphragm valves and fluid pressure to decode the hole arrangement and operate a recording device.

3,576,972
DOCUMENT CARRIER
Daniel J. Wood, 510 Sage Valley Drive, Richardson, Tex., and Harold E. Wood, 329 S. Prospect Ave., Park Ridge, Ill.
Filed Sept. 12, 1969, Ser. No. 857,410
Int. Cl. G06k *19/02*
U.S. Cl. 235—61.12R **2 Claims**

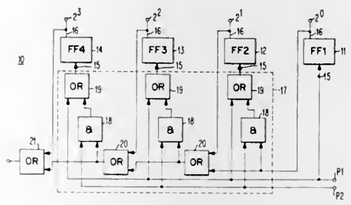
A document carrier envelope for processing checks through automatic magnetic character recognition sorting equipment. The document carrier includes generally rectangular back and front sheets of approximately the same size. The front sheet is formed of relatively translucent material so that a check carried by the document carrier can be read, photographed or microfilmed and the front sheet is adhesively secured to the back sheet along one of the shorter side edges and along a line spaced from one of the longer side edges of the sheets. An elongated magnetic indicia-receiving strip is secured to the front sheet adjacent the adhesively secured longer side edges.



ERRATUM

For Class 235—61—114 see:
Patent No. 3,577,203

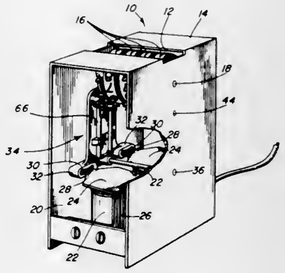
3,576,973
BINARY REGISTER
Wilburn D. Draper, Thousand Oaks, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 30, 1969, Ser. No. 820,400
Int. Cl. G06m *3/14;* **H03k** *21/06*
U.S. Cl. 235—92 **16 Claims**



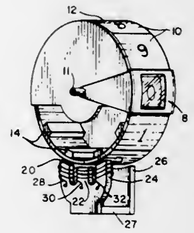
A versatile binary register which has control means for selectively setting the register to the one's and two's complements in response to first and second control signals, respectively. In addition, alternate application of the first and second control signals causes the register to function as a counter which operates in the forward mode if the first and second control signals are applied in a given sequence and/or operates in the reverse mode if the signals are applied in an opposite sequence.

3,576,974
ADD AND SUBTRACT COUNTER
Francis P. Knox, Bloomfield, Conn., assignor to Redington Counters, Inc., Windsor, Conn.
Filed Sept. 26, 1969, Ser. No. 869,996
Int. Cl. G06m *3/14, 1/10*
U.S. Cl. 235—92C **13 Claims**

A counter has a novel drive assembly including a pinion cooperating both with a number wheel and also with an oscillatable ratchet to permit selective adding and subtracting. The pinion member has two adjacent axial portions with each portion having teeth spaced about the circumference. The number wheel is in meshing engagement with a first portion of the pinion member and the ratchet is mounted for oscillation adjacent the second portion thereof. Biasing means is provided to urge a tooth of the pinion member into engagement with suitable means on the ratchet when the ratchet is in either of two positions spaced from a neutral point therebetween, so that return of the ratchet to its neutral point from one of those positions causes rotation of the pinion in a direction opposite to the direction of oscillation of the ratchet. The biasing means also prevents engagement of a tooth with the ratchet at a wrong point during the cycle to avoid spurious action.



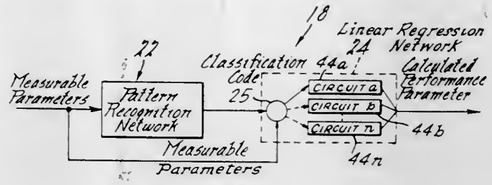
3,576,975
REVERSIBLE COUNTER WITH READOUT
Joachim A. Maass, 3212 Querns Road, Belmar, N.J.
Filed June 14, 1968, Ser. No. 737,130
Int. Cl. G06m *3/14*
U.S. Cl. 235—92 **2 Claims**



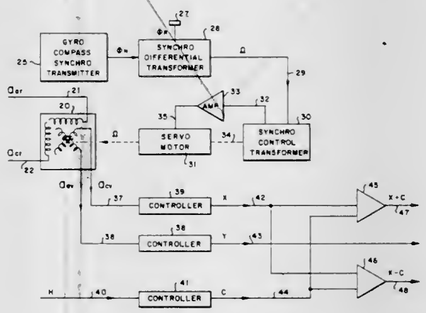
The invention describes apparatus for counting a sequence of events and for displaying the final count of that sequence. A number of magnetic cores are energized and deenergized sequentially to produce a changing magnetic field. Ferromagnetic plates on a rotatable cylinder are arranged such that the changing magnetic field exerts a force on the plates which results in rotation of the cylinder to place any of a series of characters imprinted on the periphery of the cylinder at a viewing panel. The cylinder may be rotated in either direction of changing the order of energization of the cores to correspond to either addition or subtraction.

3,576,976
NONLINEAR OPTIMIZING COMPUTER FOR PROCESS CONTROL
Frank A. Russo, Royal Oak, and Robert J. Valek, Farmington, Mich., assignors to The Bendix Corporation
Filed Oct. 19, 1967, Ser. No. 676,586
Int. Cl. G05b *13/02;* **G06k** *9/06*
U.S. Cl. 235—150.1 **7 Claims**

An apparatus for converting an input signal representing a set of measured process parameters such as temperature, vibration or torque into an output signal representing a set of nonmeasurable process performance parameters such as tool wear, surface finish or production costs having a pattern recognition circuit for classifying the measurable parameters into one of a plurality of classes and a linear regression network for each class being selectable in accordance with the classification to calculate the performance parameters.



3,576,977
SYSTEM AND METHOD FOR CONTROLLING THE POSITIONING SYSTEM OF A PIPELAYING VESSEL
Robert H. Kolb, Cypress, Tex., assignor to Shell Oil Company, New York, N.Y.
Filed Aug. 26, 1968, Ser. No. 755,304
Int. Cl. G06g *7/70;* **B63b** *35/04*
U.S. Cl. 235—150.27 **4 Claims**

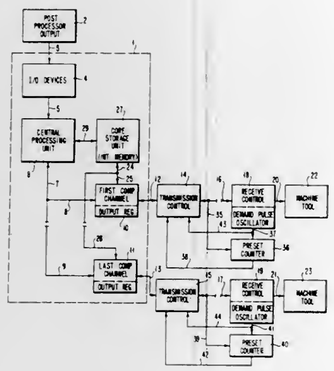


A system and method for controlling the movement, position and orientation of a pipelaying vessel in a manner designed to permit moving the vessel along a desired route while maintaining a desired tension in the pipe and while minimizing the bending forces in the pipe and pipe support structure which result from crosscurrents or misalignment of the vessel. Vessel movement along the route may be at a selected steady rate or may be intermittent and synchronized with the pipeline assembly process being conducted onboard.

3,576,978
SYSTEM FOR ACCOMODATING VARIOUS MACHINE TOOL RESOLUTIONS FROM A STANDARD PROGRAM
Jack Rosenberg, Pacific Palisades, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 13, 1968, Ser. No. 728,685
Int. Cl. B23g *21/00;* **G06f** *15/46*
U.S. Cl. 235—151.11 **10 Claims**

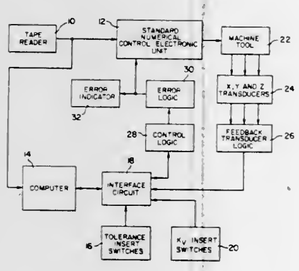
A system for providing the correct number of pulses to drive any machine tool having a resolution of less than 0.001 inch from a standard program written for control of a machine tool having a resolution of 0.001 inch. Command words containing control bits for control of the various axes of a machine tool are stored in a computer memory and gated out under control of pulses provided by an oscillator. If a command word from the buffer of the computer memory is gated out each millisecond and the standard program is written for a machine tool having a 0.001 inch resolution, a maximum vector feedrate of 60 inches per minute can be provided. If the machine tool which is to be controlled has a resolution of u inches and $m=0.001/u$ is an integer, which is

the usual case, the frequency of the pulses as well as the number of pulses in the pulse train must be modified. An oscillator which produces 1,000 *m* pulses per second is used to pulse a preset counter which is preset to *m* and therefore, sends 1,000 demand pulses per second to cause a new command word to be read from the computer memory every millisecond into an output buffer. The pulses from the oscillator are also fed directly to a transmission control device which



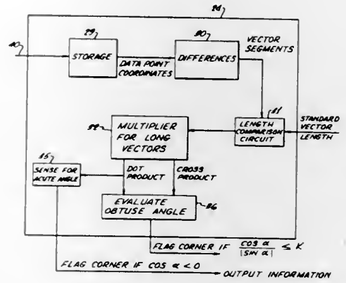
gates the command word in the output buffer to the machine tool. The result is that each command word is gated *m* times to the machine tool. To position the machine tool cutter at the end of a cut with the actual resolution built into the machine tool, the preset counter is set to 1 when the distance from the end of the line segment being cut is less than 0.001 inch so that each of the command words is sampled only once.

3,576,979
MOTION MONITOR SYSTEM
Amiel J. McCall, South Euclid; Ronald D. Elms, Mayfield Heights, and Larry D. Rice, Novelty, Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.
Filed Sept. 24, 1968, Ser. No. 762,097
Int. Cl. G06f *15/46*; **G05b** *19/18*
U.S. Cl. 235—151.11 **7 Claims**



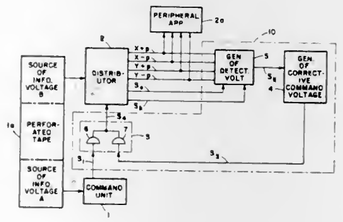
A system for monitoring the motion of a numerically controlled machine tool to avoid costly errors. The motion command data that is normally supplied to the machine tool is also supplied to the monitoring system. Additionally, data from the machine tool slide transducers representative of the actual machine tool motion are fed back to the monitoring system. Tolerance data are also supplied to the monitoring system. On the basis of the data supplied thereto, the monitoring system continually determines whether or not a sufficient error exists to shut down the machine tool.

3,576,980
AUTOMATIC CORNER RECOGNITION SYSTEM
Harold W. Doyle, Newport Beach, Calif., assignor to California Computer Products, Inc., Anaheim, Calif.
Filed Mar. 28, 1968, Ser. No. 716,918
Int. Cl. G06f *7/38*
U.S. Cl. 235—152 **6 Claims**



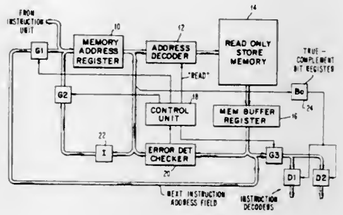
The angular change between successive line segments connecting consecutive data points defining a sample shape may be used to determine corners for controlling automatic pattern grading. When the segments are represented in vector notation the angular evaluation may be conveniently determined from the dot and cross product of the angle-forming vectors. Where long vectors are separated by short vectors, a corner reconstruction technique can be employed to locate a vertex approximately representative of the original sample shape.

3,576,981
DIGITAL INTERPOLATOR WITH A CORRECTIVE DISTRIBUTION COMMAND DEVICE
Kiyokazu Okamoto, and Masayuki Miyazaki, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan
Filed Mar. 28, 1968, Ser. No. 716,954
Claims priority, application Japan, Mar. 31, 1967, 42/20527
U.S. Cl. 235—152 **16 Claims**



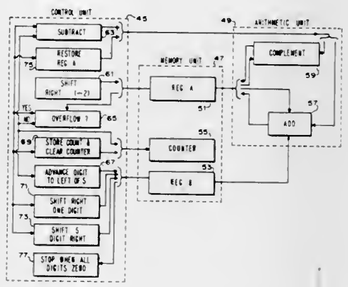
A corrective digital interpolator providing sequential steps in X and Y coordinates for tracing new curves from a prototype curve and for minimizing deviations of the new curve from the prototype curve, comprising translating coordinate signals and distribution signals representing, for example, a direction (vertical) other than the direction (horizontal) corresponding to a maximum component (horizontal) of a vector at different followup points, translating the other signals into corrective signals in such manner that the latter signals have a ratio of 3 to 2 relative to the other signals, and translating distribution command rate signals and corrective signals into corrected command rate signals for minimizing the deviations of the new curves from the prototype curve, the latter signals comprising logic sums of the distribution command rate signals and the corrective signals.

3,576,982
ERROR TOLERANT READ-ONLY STORAGE SYSTEM
Keith A. Duke, Wappingers Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 16, 1968, Ser. No. 783,925
Int. Cl. G11c *29/00*; **G06f** *11/00*
U.S. Cl. 235—153 **9 Claims**



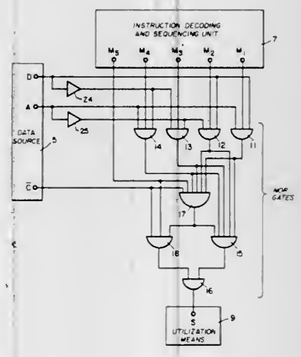
A read-only storage system wherein each data word is stored twice, once in its true form and once in its complement form. Said two data words are further stored at complementary addresses and means are provided upon readout of any data word for detecting a system error. Said means being further operative to automatically access an address complementary to the one currently being utilized for reading out the same data word in the complementary form at said complementary address.

3,576,983
DIGITAL CALCULATOR SYSTEM FOR COMPUTING SQUARE ROOTS
David S. Cochran, Palo Alto, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 2, 1968, Ser. No. 764,436
Int. Cl. G06f *7/48*
U.S. Cl. 235—158 **6 Claims**



In a data processing system, a control unit is provided for controlling the functions and operational sequence of a memory unit and an arithmetic unit so as to derive the square root of any given number. The control system includes two iterative control loops, the first of which initially subtracts a predetermined subtrahend term from one-half of the given number. Thereafter this control loop successively subtracts an incrementally advanced subtrahend term from the difference formed by the immediately preceding subtraction operation. The second iterative control loop reduces the degree of significance of the subtrahend digits when the difference formed by a subtraction operation is negative. The number of positive differences formed by the first control loop are counted and these counts represent the square root of the given number.

3,576,984
MULTI-FUNCTION LOGIC NETWORK
Roland S. Gregg, Jr., Canoga Park, Calif., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.
Filed Aug. 9, 1968, Ser. No. 751,607
Int. Cl. G06f *7/385, 7/38*
U.S. Cl. 235—176 **13 Claims**

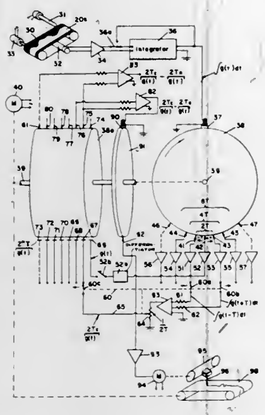


A multifunction logic network is provided to perform a selected one of a plurality of operations, each a function of one, two or three variables and five control signals. A first plurality of gates provide all possible AND functions of two variables A and D, each in response to a separate control signal. A fifth gate then provides all possible inverted functions of a third variable C when true and one or more of the other variables A and D in response to the output signals of the first four gates and a fifth control signal. All possible AND functions of two variables are then combined by a sixth gate with the output of the fifth gate. A seventh gate provides all possible inverted functions of the third variable C when false and the other variables A and D in response to the output of the fifth gate and the fifth control signal. An eighth gate effectively OR's the complements of the sixth and seventh gates to provide all of 30 possible functions of one or more of the variables A, D and C. The remaining two operations consist of selectively transmitting one of two possible binary constants.

3,576,985
METHOD OF AND MEANS FOR TREATING GRAVITY PROFILES
Philip L. Lawrence, Riverside, Conn., assignor to Mobil Oil Corporation
Continuation of application Ser. No. 214,973, Aug. 6, 1962, now abandoned. This application Sept. 20, 1967, Ser. No. 669,314
Int. Cl. G06g *7/19*; **G01v** *7/36*
U.S. Cl. 235—181 **16 Claims**

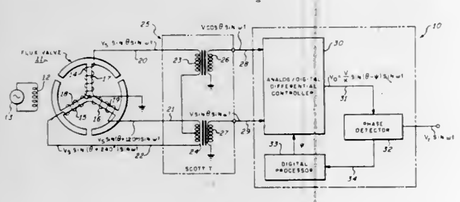
A gravity profile containing gravitational anomalies is utilized and treated to provide information as to depths of the sources of the anomalies. The initial measurements of gravity potential along the line of exploration making up the gravity profile are corrected for change in elevation and a plurality of averaged gravity profiles are generated. The generated

profiles are subtracted from one another to generate dif-



ference profiles in which the several anomalies appear in turn and in greatly enhanced form.

3,576,986
ANALOG/DIGITAL DIFFERENTIAL APPARATUS FOR COMPARING RESOLVER OUTPUT DATA WITH A DIGITAL SIGNAL
David R. Brickner, and Billy K. Swift, Phoenix, Ariz., assignors to Sperry Rand Corporation
Filed Jan. 14, 1969, Ser. No. 790,987
Int. Cl. G06g *7/22;* **G06j** *1/00*
U.S. Cl. 235—189 **13 Claims**



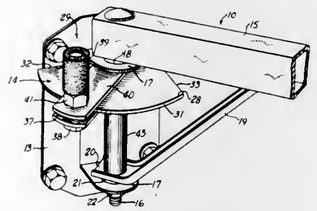
Apparatus for comparing an analog input signal with a digital input signal and providing an analog output signal proportional to the difference therebetween, said apparatus comprising an analog/digital differential controller including digital-to-analog converters responsive to the more significant bits of the digital signal and operating in combination with multiplier and subtractor devices for establishing a coarse relationship between the analog and digital input signals and supplying an accurate reference voltage to a fine resolution digital-to-analog converter which is responsive to the less significant bits of the digital signal to produce fine data for summing with the coarse data and thereby form the output signal.

3,576,987
CHEMICAL LIGHTING DEVICE TO STORE, INITIATE AND DISPLAY CHEMICAL LIGHT
Heinz Kurt Walter Voight, Ridgefield, and Robert Lee Myers, Darien, Conn., assignors to American Cyanamid Company, Stamford, Conn.
Continuation-in-part of application Ser. No. 674,296, Oct. 10, 1967, now abandoned. This application Nov. 7, 1968, Ser. No. 777,987
Int. Cl. F21k *2/00*
U.S. Cl. 240—2.25 **6 Claims**

A device for providing chemiluminescent light from a chemical reaction of suitable compounds in the presence of a fluorescent compound, the device being a self-contained light unit, the device comprising an outer flexible, cylindrical, light transmitting container for one reactive composition, and an inner, rigid container for another reactive composition. Flex-

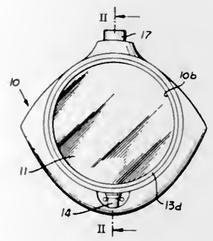
ing the outer container breaks the inner container, allowing the reactive compositions to mix and produce a reaction providing chemiluminescent light which is visible through the outer light transmitting container.

3,576,988
ADJUSTABLE STOP FOR SWINGABLE FLOODLIGHTS
Donald S. Henning, Thiensville, Wis., assignor to Phoenix Products Company, Inc., Milwaukee, Wis.
Filed June 6, 1968, Ser. No. 735,027
Int. Cl. F21p *1/00*
U.S. Cl. 240—3 **7 Claims**



An arm structure that mounts a floodlight swings back and forth over a stop plate and collides with an abutment thereon that defines the operative position of the floodlight. The abutment is adjustable to different arm stopping positions along a curved edge of the plate.

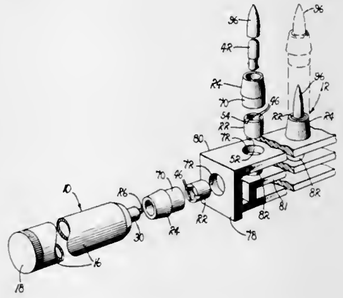
3,576,989
PURSE-SIZE FACE-ILLUMINATING FLASHLIGHT AND MIRROR
Sidney Schwartz, Manhattan, N.Y. (375 West End Ave., New York, N.Y. 10024)
Filed Oct. 14, 1968, Ser. No. 767,362
Int. Cl. F21v *33/00*
U.S. Cl. 240—4.2 **3 Claims**



A lady's handbag-size mirror is mounted in a molded plastic frame formed with a cavity extending diametrically

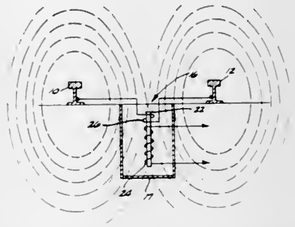
behind the mirror containing a dry cell battery. A lightbulb extends from one end of the cavity beyond the periphery of the mirror and is adapted to project light beams to the face of a user looking into the mirror. A removable depressible button extends from the other end of the cavity for actuating a normally open switch to light the bulb and permits access to the cavity for changing the battery and bulb. The frame is formed in mating halves which meet substantially in a plane parallel to that of the mirror.

3,576,990
LIGHTING SYSTEM
Wallace F. Johnson, 1287 W. Shaw, and William H. Tilson, 7560-A North Charles, Fresno, Calif.
Filed Sept. 27, 1968, Ser. No. 763,148
Int. Cl. F21p *1/00*
U.S. Cl. 240—10 **7 Claims**



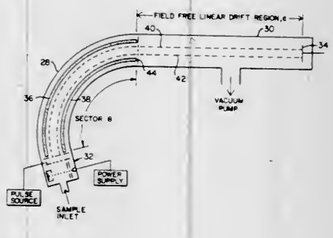
A versatile lighting system particularly characterized by a multiplicity of supporting bases, each conforming to a candlelike, truncated, frustoconical configuration surmounted by an interchangeable translucent, flame-shaped tip and including therein a miniature lamp disposed within a universal female receiver of a type particularly adapted to receive miniature lamp bases without regard to their configuration. The system electrically is connected in parallel with a portable source of electrical energy through a universal male connector seated in a receiver so that a plurality of radiating candlelike structures may be readily assembled for use as an ornamental lighting system in decorative schemes, including wall arrangements, centerpieces, floral arrays, and the like.

3,576,991
TRACK CIRCUIT PICKUP UNIT
Harlan J. Wilson, Sunnymead, Canada, assignor to Marquardt Industrial Products Co., Cucamonga, Calif.
Filed Jan. 23, 1969, Ser. No. 793,447
Int. Cl. B61l *21/00*
U.S. Cl. 246—40 **5 Claims**



Apparatus is described which detects the presence of a train within a given area. The apparatus includes a sensing unit which comprises an iron core transformer vertically positioned between the rails of a railroad track. A single-loop primary winding is coupled across the track. A secondary winding of the transformer is coupled to a receiver. At least one transmitter is coupled to the track at a predetermined distance from the sensing unit. The receiver detects secondary voltage induced by the track voltage applied to the primary winding. The wheel and axle of the train, when approaching the given area between the selected transmitter and the receiver, from the receiver end causes current to flow in the rails past the sensing unit, which through magnetic flux coupling to the sensing device adds in polarity to the magnetic flux in the core due to the primary winding, thereby increasing the signal induced into the secondary winding. This signal is detected by the receiver. When the train is within the given area between the selected transmitter and the receiver, the wheels and axle act as a shunt to short out any signals from the desired transmitter to the pickup unit.

3,576,992
TIME OF FLIGHT MASS SPECTROMETER HAVING BOTH LINEAR AND CURVED DRIFT REGIONS WHOSE ENERGY DISPERSIONS WITH TIME ARE MUTUALLY COMPENSATORY
Charles J. Moorman, and John Q. Parmater, Cincinnati, Ohio, assignors to The Bendix Corporation
Filed Sept. 13, 1968, Ser. No. 759,645
Int. Cl. H01j *39/36*
U.S. Cl. 250—41.9 **9 Claims**

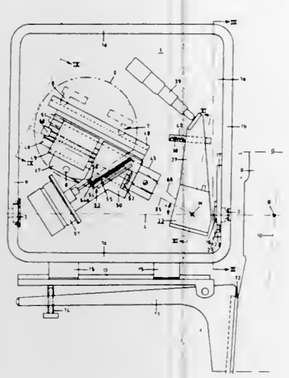


A mass spectrometer is disclosed which is based on the linear time-of-flight principle. Initial ion energies are compensated for by combining a curved drift region with a linear drift region so that ions of the same mass but differing energies reach the collector at the same time.

3,576,993
X-RAY CAMERA FOR X-RAY DIFFRACTION ANALYSIS ACCORDING TO GUINIER
Gunnar Hagg, Uppsala, Sweden, assignor to Incentive Research & Development AB, Bromma, Sweden
Filed Jan. 16, 1969, Ser. No. 791,731
Claims priority, application Sweden, Jan. 25, 1968, 1021/1968
Int. Cl. G01n *23/20*
U.S. Cl. 250—51.5 **11 Claims**

An X-ray camera for X-ray diffraction analysis of powderous material according to the Guinier method, which camera comprises an airtight and evacuatable casing having a radiation entrance window for X-ray radiation, in which casing all the components of the camera, as a crystal holder for a monochrometer crystal, a specimen holder for the specimen to be analyzed and a film holder, are mounted. The crystal holder is preferably removably mounted on a support plate which is rotatable about an axis perpendicular to the direction of the X-ray radiation incident through the entrance window of the casing. A support and guide rail can be mounted or positioned in anyone of a number of different positions in the casing radially extending from the axis of rotation of the support plate for the crystal holder. Two carriages are movably supported on the support and guide rail and lockable relative thereto in desired positions. One of the carriages carries the specimen holder, whereas the other car-

riage can be mechanically coupled or connected to the film holder so as to determine the position of the film holder. The



principal advantage of this X-ray camera is that it can easily and rapidly be adjusted for different wavelengths of the X-ray radiation used for the diffraction analysis.

ERRATA

For Classes 250—83.1 and 250—65 see:
Patent Nos. 3,577,199 and 3,577,204

3,576,994
NEUTRON RADIOGRAPHY OF DEUTERATED TISSUE

Paul B. Parks, Aiken, S.C., and Mark Brown, Augusta, Ga., assignors to The United States of America as represented by the United States Atomic Energy Commission.

Filed July 14, 1969, Ser. No. 841,573
Int. Cl. G01t *3/00*

U.S. Cl. 250—83.1 **5 Claims**

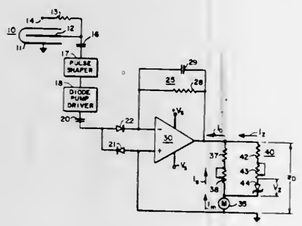
An improved method of preparing a neutron radiograph of biological media by first contacting the media with a fluid containing deuterium such as deuterium oxide. The protium in the nonfatty tissue is replaced with deuterium to substantially reduce the neutron capture and scatter within the deuterated tissue. Consequently, the radiolucency of the nonfatty tissue is greatly increased. Deuterium does not significantly replace the protium in the fatty tissue which therefore remains radiopaque in contrast to the radiolucent nonfatty tissue.

3,576,995
RADIATION SURVEY METER COUNTING LOSS COMPENSATION CIRCUIT

Joseph C. Nirschl, West Long Branch, and G. Edgar Mooney, Jr., Pt. Pleasant, N.J.

Filed Dec. 2, 1968, Ser. No. 780,505
Int. Cl. G01t *1/16*

U.S. Cl. 250—83.3 **3 Claims**



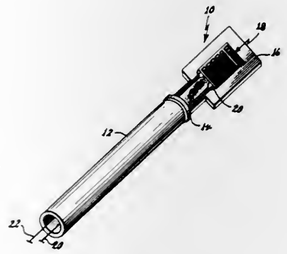
A radiation survey meter including a radiation detector, an operational amplifier and a current meter in the output circuit thereof wherein the counting loss error of the detector, which causes a reduction in current at high dose rate levels, is compensated for by means of a Zener diode connected in circuit with a resistive network in the output circuit of the operational amplifier. For higher radiation dose levels, the output voltage of the operational amplifier exceeds the voltage at which the Zener diode starts conducting. The resulting impedance change in the output circuit causes additional current flow in the current meter. By proper selection of a Zener diode and the resistance network associated therewith, the dead time effect of the radiation detector can be adequately compensated for.

3,576,996
INSTRUMENT FOR MEASURING THE NET FLUX OF RADIANT ENERGY THROUGH A PLANE

Donald W. Stevens, West Concord, Mass., assignors to The United States of America as represented by the Secretary of the Air Force.

Filed Apr. 14, 1969, Ser. No. 815,761
Int. Cl. G01t *1/16*

U.S. Cl. 250—83.3 **1 Claim**



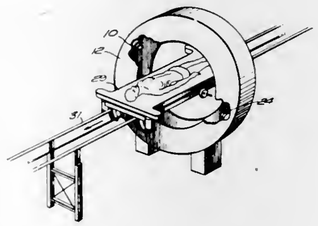
A pair of solar radiation-absorbing surfaces mounted on opposite sides of a probe utilize the Seebeck and Peltier effects to maintain equal surface temperatures thereby avoiding errors due to wind. The current produced by the effects is a measure of the net radiation.

3,576,997
PARTICLE ACCELERATOR EMPLOYING A REVOLVING ELECTRIC FIELD FOR GENERATING X-RAYS

Peter E. Slavin, Cambridge, Mass., assignor to Intelligent Instruments, Inc., Woburn, Mass.

Division of Ser. No. 469,505, July 6, 1965, Pat. No. 3,432,657, filed Sept. 24, 1968, Ser. No. 762,051
Int. Cl. G03b *41/16*

U.S. Cl. 250—90 **6 Claims**



A stereoscopic image is obtained from an X-ray scanning instrument in which the patient is moved along the axis of a rotating X-ray source with an X-ray receiver located oppositely the source and rotating with it to generate a helical scanning motion with respect to the patient. The X-ray receiver generates electrical signals which are recorded on magnetic tape and the tape is employed to operate a stereo

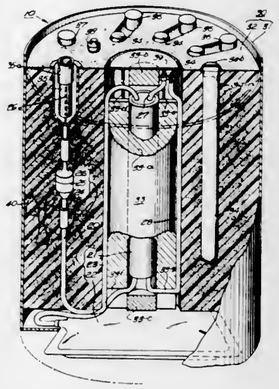
video system. A compact particle accelerator employing a revolving electrical field is provided for producing highly directional and monochromatic X-ray beams.

3,576,998
SELF CONTAINED, CLOSED SYSTEM AND METHOD FOR GENERATING AND COLLECTING A SHORT LIVED DAUGHTER RADIONUCLIDE FROM A LONG LIVED PARENT RADIONUCLIDE

Marshall E. Deutsch, Sudbury; Louis W. Mead, Lexington, and Zoltan Nagy, Quincy, Mass., assignors to Nen-Picker Radiopharmaceuticals, Inc., Boston, Mass.

Filed Nov. 16, 1966, Ser. No. 594,713
Int. Cl. G21g *5/00*

U.S. Cl. 250—106 **47 Claims**



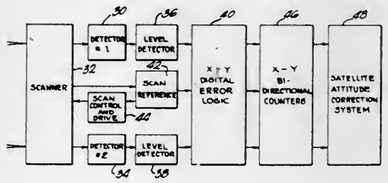
A sterile, pyrogen free, self-contained closed radionuclide generator system in which the eluant for extracting the daughter from the generator column, containing the parent and daughter on a supporting substrate, is prepackaged and stored in a predetermined amount in a sealed, flexible, collapsible plastic bag. The bag is sealably connected to the generator column by a conduit. The eluant is drawn from the bag through the generator column and is automatically withdrawn from the column and collected as an eluate of the daughter in the eluant by impaling a pierceable wall of a sealed evacuated eluate collecting tube on a cannula which is sealably connected to the generator to thereby apply a vacuum to the eluant in the bag to draw it through the generator and cannula into the evacuated eluate collecting tube.

3,576,999
METHOD AND APPARATUS FOR DETERMINING THE ORIENTATION OF AN OBJECT RELATIVE TO AN ELLIPTIC OBJECT

Richard Blythe; Gerald C. Scott; Edgar A. Work, Jr.; Donald S. Lowe, and Philip G. Hasell, Jr., Ann Arbor, Mich., assignors to The Bendix Corporation

Filed Jan. 16, 1965, Ser. No. 609,520
Int. Cl. G01j *1/20*

U.S. Cl. 250—203 **14 Claims**



Method and apparatus for maintaining the orientation of an object, such as a satellite or spacecraft, with respect to a primary object, such as the earth, by sensing points of interception of the primary object's horizon with two scan lines and correlating the sensed information.

ERRATUM

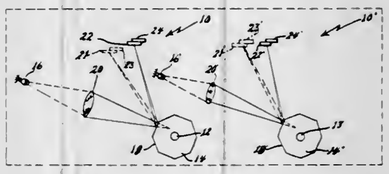
For Class 250—113 see:
Patent No. 3,577,205

3,577,000
SYNCHRORESOLVER WITH OPTICAL FEEDBACK LOOP

David A. Warner, Cambridge, Mass., assignor to the United States of America as represented by the Secretary of the Air Force.

Filed Aug. 21, 1969, Ser. No. 851,981
Int. Cl. G01d *5/30, 5/34*

U.S. Cl. 250—230 **13 Claims**



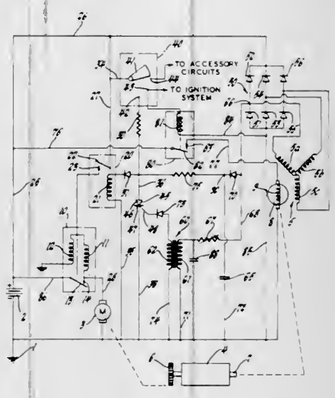
A synchroresolver having a reflective means, a radiant source, a lens and a pair of energy sensors for determining the angular displacement of a rotating body. The reflective means may constitute a reflective prism, a plurality of convex cylindrical reflectors, or the combination of both. The radiant source reflects its radiant energy off the reflective means and onto the pair of energy sensors. The voltage output of the energy sensors is then utilized in making the desired angular determinations.

3,577,001
ELECTRIC CRANKING MOTOR AUTOMATIC DISCONNECT AND LOCKOUT CIRCUIT

Donald L. Cummins, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 31, 1969, Ser. No. 872,939
Int. Cl. F02n *11/08*

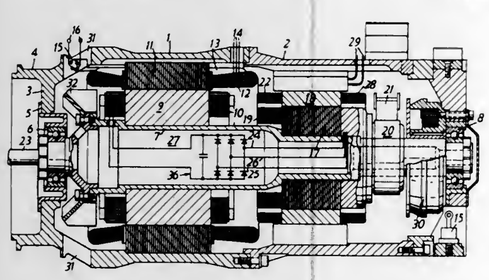
U.S. Cl. 290—38 **2 Claims**



An electric cranking motor automatic disconnect and lockout circuit. The normally open contacts of an electric-cranking-motor-solenoid-operated switch, having the operating coil thereof connected across a source of DC potential through the normally open contacts of an electric relay, are connected in series with the electric cranking motor across the source of DC potential. Upon the closure of an electric

switch, an energizing circuit is established for the operating coil of the electric relay across the source of DC potential to close the associated normally open contacts thereof which establish an energizing circuit for the operating coil of the solenoid operated switch. At least a portion of the output potential of an electric generator driven by the cranked engine is transformer coupled across the gate-cathode electrodes of a silicon controlled rectifier, the anode-cathode electrodes of which are connected in parallel with the operating coil of the electric relay. When the generator output potential is of sufficient magnitude to produce gate-cathode current through the silicon controlled rectifier, the resulting anode-cathode current flow therethrough short circuits or shunts sufficient current around the operating coil of the electric relay to substantially deenergize and disenable the operating coil, consequently, the associated normally open contacts open to interrupt the energizing circuit for the operating coil of the cranking-motor-solenoid-operated switch. The silicon-controlled rectifier is maintained conductive while the engine is in the running mode, consequently, the operating coil of the electric relay is maintained disenabled thereby, a condition which prevents the reengagement of the cranking motor while the engine is in the running mode.

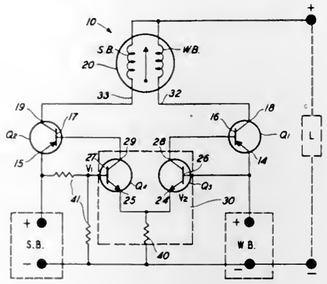
3,577,002
MOTOR-GENERATOR COMBINATION
Samuel S. Hall; Robert A. Miller, and Philip R. H. Riley, Ilford, Essex, England, assignors to The Plessey Company Limited, Ilford, England
Filed Apr. 16, 1969, Ser. No. 816,710
Claims priority, application Great Britain, Apr. 19, 1968, 18692/68
Int. Cl. F02n *11/04*
U.S. Cl. 290—46 **7 Claims**



A compact unit for supplying an aircraft with both DC and AC electric power under normal running conditions and to provide also electric starting facilities, and which can be attached to a single engine pad of an aircraft turbine, is obtained by energizing the rotor field windings of an alternator with DC power via a rectifier system participating in its rotation from the armature windings of a coaxially arranged starter motor, which for the purpose has a second multiturn field winding, the starter motor having also automatic brush-lifting gear; the DC power output is obtained from a second stator winding of the alternator via a built-in rectifier set.

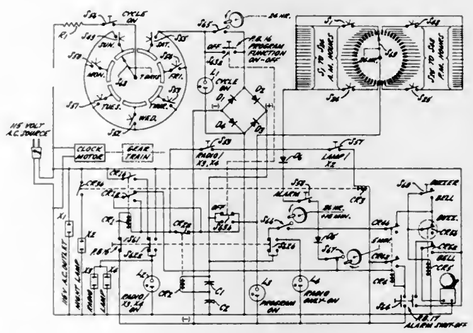
3,577,003
AUTOMATIC BATTERY-SWITCHING DEVICE
Byron C. Behr, Norwalk, Conn.; Gunars Sprogis, Cleveland, Ohio, and Frederick E. Booth, Weston, Conn., assignors to Union Carbide Corporation, New York, N.Y.
Filed Mar. 11, 1969, Ser. No. 806,215
Int. Cl. H02j *7/00*
U.S. Cl. 307—66 **3 Claims**

An apparatus for automatically switching off a working battery and switching on a standby battery when the working battery falls below a predetermined working voltage. The device utilizes at least one switching element such as a transistor associated with the working battery and at least one switching element such as a transistor associated with the standby battery, with the transistor associated with the working battery being connected so as to back bias the transistor



associated with the standby battery. When the working battery wears down to a predetermined voltage its back bias is reduced to a sufficient point so as to turn on the standby transistor and thereby switch on the standby battery.

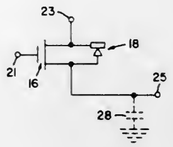
3,577,004
PROGRAMMED TIMER
Demetrios T. Tsoutsas, Berwyn, Ill. (315 W. Stimpson, Linden, New Jersey, 07036)
Filed Sept. 23, 1968, Ser. No. 784,971
Int. Cl. H01h *7/00*
U.S. Cl. 307—141 **8 Claims**



A programmed clock timer is described in which operation of an alarm and an appliance on an adjustable 24 hour sequence is supplemented with selectively programmed 24 hour and 7-day timing sequences whereby one or more appliances may be operated according to a predetermined program consisting of programmed time interval sequences. The program is visibly presented on a control panel with individual incremental time segments being programmed by an array of manually operated push-pull switches. A manual override feature separately controls a selected appliance.

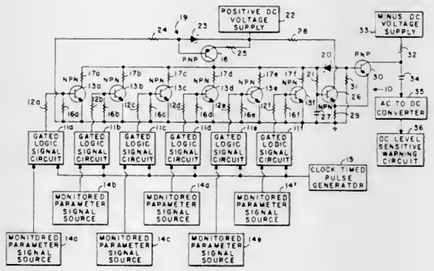
3,577,005
TRANSISTOR INVERTER CIRCUIT
Alton O. Christensen, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
Continuation-in-part of application Ser. No. 787,067, , now Patent No. 3,502,908, which is a continuation-in-part of application Ser. No. 761,450, Sept. 23, 1968. This application Nov. 24, 1969, Ser. No. 879,221
Int. Cl. H03k *19/08*
U.S. Cl. 307—205 **3 Claims**

A ratioless MOSFET inverter for capacitive outputs consists basically of a pair of MOSFET's with their sources and drains tied together. The clock input is applied to the common drain connection and to the gate of one of the MOSFET's and the output is connected to the common source connection. In an alternative construction, the MOSFET whose gate is connected to the clock is replaced by



a Schottky diode connected between the source and drain terminals of the data input MOSFET. The clock is connected to the drain terminal of the data input MOSFET, and the output is connected to the source of the data input MOSFET.

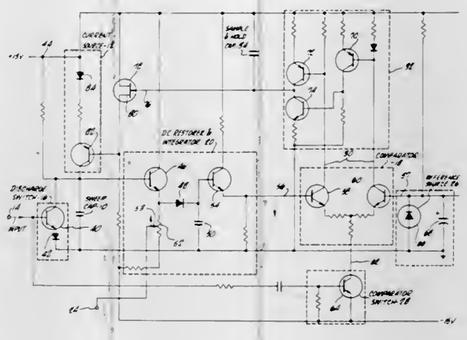
3,577,006
FAIL-SAFE PULSED LOGIC AND GATE
Leo A. Tyrrell, Marion; Daniel E. Castleberry, Cedar Rapids, and Charles A. Weber, Marion, Iowa, assignors to Collins Radio Company, Cedar Rapids, Iowa
Filed Mar. 10, 1969, Ser. No. 805,497
Int. Cl. H03k *19/08, 19/22*
U.S. Cl. 307—218 **3 Claims**



A DC logic handling fail-safe pulsed logic AND gate circuit capable of warning the user whenever substantially any single catastrophic component failure occurs inhibiting any of the functions a DC logic circuit is required to perform. It is a multiple input AND gate circuit with the inputs repeatedly pulsed to develop a resulting pulsed output when no input signals are inhibited and there are no circuit disorders within the gate circuit. Biasing circuits within the gate circuit are so subject to bias voltage variation with a signal input inhibit or internal circuit disorder as to inhibit the pulse signal output and thereby warn.

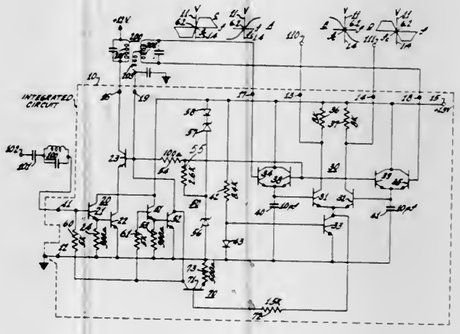
3,577,007
CONSTANT AMPLITUDE VARIABLE FREQUENCY SWEEP GENERATOR
Anthony L. Cross, Arcadia, Calif., assignor to Bell & Howell Company, Chicago, Ill.
Filed Jan. 21, 1969, Ser. No. 792,371
Int. Cl. H03k *4/08*
U.S. Cl. 307—228 **9 Claims**

A sweep generator for an oscilloscope or the like is described for providing a sawtooth output voltage in synchronism with a periodic input signal having a variable repetition rate. A sweep capacitor is discharged in response to the occurrence of each input signal and then charged by a controllable current source to establish a ramp voltage across the capacitor with a selected slope. The voltage across the capacitor is compared with a reference voltage by means of a comparator circuit during a brief time interval at the end of each charging cycle. The comparator circuit controls the



magnitude of the current supplied to the sweep capacitor to maintain the peak output voltage substantially constant.

3,577,008
AUTOMATIC FREQUENCY CONTROL APPARATUS
Jack Craft, Somerville, N.J., assignor to RCA Corporation
Filed Jan. 22, 1969, Ser. No. 792,983
Int. Cl. H03k *5/20*
U.S. Cl. 307—233 **6 Claims**

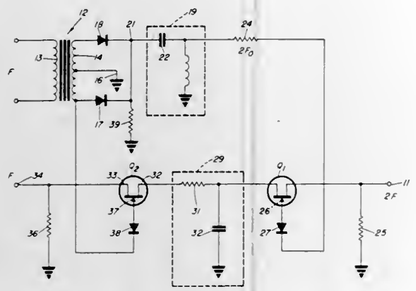


Automatic frequency control apparatus including a differential amplifier-detector biased so as to be responsive only to signals exceeding a predetermined amplitude value established to effectively reduce undesired pull-in of adjacent signal frequencies.

3,577,009
QUADRATURE REJECTION AND FREQUENCY CONVERSION CIRCUIT
Laurence C. Hofmeister, Fort Lauderdale, Fla., assignor to The Bendix Corporation
Filed Feb. 17, 1969, Ser. No. 799,772
Int. Cl. H03b *3/04*
U.S. Cl. 307—233 **10 Claims**

A circuit for eliminating quadrature components from a sinusoidal input signal is described. The circuit also divides

the frequency of the input signal and converts it into a square wave. Conversion of the input is achieved by the use of a



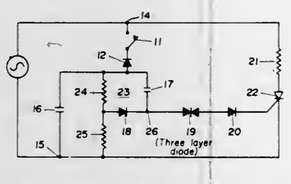
dividing signal and tandem connected gating circuits which operate on the sinusoidal input signal.

ERRATUM

For Class 307—240 see:
Patent No. 3,577,206

3,577,010
ZERO POINT SWITCHING CIRCUIT FOR TURN-ON OF GATE-CONTROLLED CONDUCTING DEVICES

Edward N. Freyling, Jr., and Robert E. Gregson, Scottsdale, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.
Filed Jan. 31, 1969, Ser. No. 795,577
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 **9 Claims**

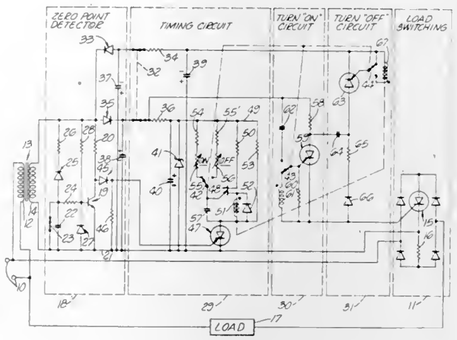


A zero point switching circuit for an SCR coupled in series with an AC source and a load is described. The combination of a switch, a first diode and a voltage divider is coupled across the source. The variable tap of the divider is coupled via a second diode and a first capacitor to the first diode. A second capacitor is coupled across the voltage divider. When the switch is closed, the first capacitor charges during one-half cycle toward a voltage level determined by the divider. The discharge path for the first capacitor is provided by a three-layer diode coupled between the control electrode of the SCR and the first capacitor. When the line voltage decreases prior to the next half cycle, the first capacitor voltage exceeds the threshold voltage of the three-layer diode whereby this capacitor discharges through the SCR into the second capacitor. The second capacitor charges to a voltage sufficient to render the three-layer diode nonconductive and then discharges through the voltage divider to permit the first capacitor to again discharge into the gate of the SCR. As a result, the first capacitor repetitively discharges into the gate of the SCR with large current spikes at or just prior to the zero point of the line voltage.

3,577,011
TEST CIRCUIT

Joseph Gino Raffaelli, Granda Hills, and Hendricus Johnnes Lokkart, Arleta, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed June 13, 1968, Ser. No. 736,686
Int. Cl. H03k *17/00*
U.S. Cl. 307—252C **2 Claims**

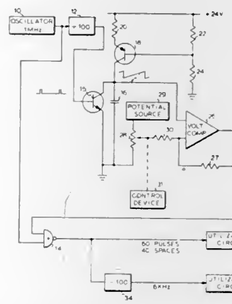
There is disclosed a circuit including a gate-controlled switch for gating alternating current to a load. A timing circuit is employed to turn the switch on or off at a predetermined time after the line voltage reaches zero. The device of the invention is especially useful as a test circuit for applying



a voltage or interrupting a current to a load at a predetermined time during the cycle of the line voltage. A zero point detector having a manually operable switch is employed to actuate the timing circuit.

3,577,012
CIRCUIT FOR CONTROLLING FREQUENCY WITH VOLTAGE

Ernst H. Dummermuth, E. Cleveland, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.
Filed Oct. 3, 1968, Ser. No. 764,732
Int. Cl. H03k *1/14*
U.S. Cl. 307—271 **6 Claims**



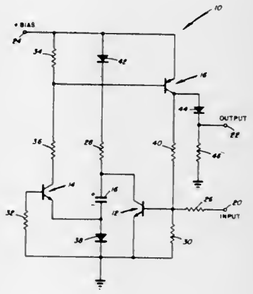
A circuit for providing output pulses at a frequency determined by a variable DC control voltage. The circuit includes a gate to which an oscillator output is applied. The gate is controlled by the output of a comparator circuit which compares the amplitude of a ramp signal with the DC control voltage. The ramp signal is generated at a frequency which is a subharmonic of the oscillator frequency. The gate passes the oscillator output pulses as long as the ramp signal amplitude is less than the DC control voltage.

3,577,013
LOW STANDBY POWER MONOSTABLE MULTIVIBRATOR HAVING NONCRITICAL CUTOFF

Eric J. Hoffman, Baltimore, Md., assignor to The United States of America as represented by the Secretary of the Navy.
Filed Sept. 6, 1968, Ser. No. 757,872
Int. Cl. H03k *3/26*
U.S. Cl. 307—273 **12 Claims**

A monostable multivibrator circuit, or one-shot, which consumes virtually no power while in its standby state and

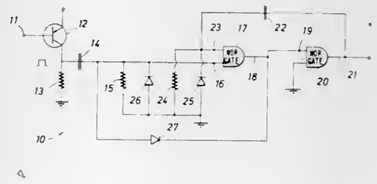
having noncritical cutoff. Under quiescent conditions all circuit transistors are nonconductive and a circuit capacitor is fully charged. An input signal causes a first transistor to become conductive and thereby causes the capacitor to discharge exponentially from a negative potential toward a positive potential. The discharge time associated with the



capacitor determines the on-time of the instant one-shot. Second and third transistors are connected into the circuit in such a manner that the circuit regeneratively turns on and degeneratively turns off. Further, the circuit is provided with means for preventing false triggering by voltage spikes from the power supply or from the load.

3,577,014
MONOSTABLE MULTIVIBRATOR WITH COMPLEMENTARY NOR GATES

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Robert W. O'Neill, 5218 DeMilo, Houston, Tex.
Filed July 8, 1970, Ser. No. 53,156
Int. Cl. H03k *3/26, 18/34*
U.S. Cl. 307—273 **8 Claims**

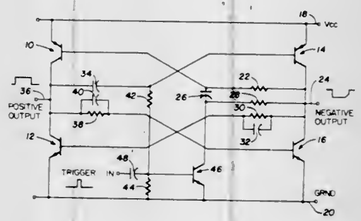


First and second positive NOR complementary Mos gates are employed to form a monostable multivibrator circuit in which the output of the first gate forms the input to the second gate and the output of the second gate forms the system output. The trigger signal supplied to the gates is differentiated through a resistance-capacitance circuit and supplied to the first gate. The differentiated signal may be bypassed across the first gate through a semiconductor diode to the input of the second gate to permit narrow pulse width outputs to reduce input pulse power and to increase the duty cycle of the circuit. A feedback capacitor connected across both gates is employed in an internal resistance-capacitance circuit to provide the time constant for the multivibrator.

In a modified form, a plurality of monostable multivibrator circuits are employed together to generate a sequence of control pulses in a date processor.

3,577,015
MONOSTABLE MULTIVIBRATOR WITH LOW POWER REQIREMENTS

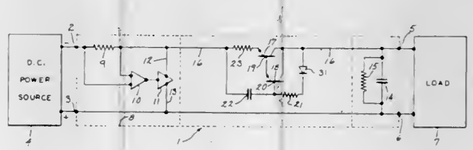
George W. Niemann, Dallas, and Robert A. Stehlin, Richardson, Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.
Filed Dec. 30, 1968, Ser. No. 787,794
Int. Cl. H03k *3/26*
U.S. Cl. 307—273 **7 Claims**



The invention disclosed is a monostable multivibrator circuit having first and second pairs of complementary transistors, with each pair connected collector-to-collector in series. The bases of the first pair of transistors are coupled to a first output terminal at the juncture between collectors of the second pair of transistors. The bases of the second pair of transistors are coupled to a second output terminal at the juncture between the collectors of the first pair of transistors. Terminals are provided for applying electrical power across the first and second pairs of transistors in order to maintain one transistor in each of the transistor pairs in a conductive state. A normally nonconductive trigger transistor is connected to the circuit for receiving a trigger signal in order to vary the state of each of the transistors for a preselected monostable timing period.

3,577,016
LOW PASS ACTIVE FILTER

Hans E. Weidmann, Glendale, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.
Filed Sept. 12, 1968, Ser. No. 759,339
Int. Cl. H03k *1/14*
U.S. Cl. 307—297 **7 Claims**

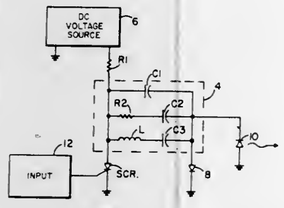


A filter circuit for connection between a direct current power supply and a load which has incorporated in the series line running between the input and output terminals of the filter circuit a network that presents a high impedance to alternating current components that appear at either end of the filter, such network presenting relatively small resistance to direct current load currents that flow through the filter. The network shown has a transister with its emitter and collector elements connected in the filter series line, and the base element of the transistor is connected to (i) a bias resistor that has its opposite end joined through a diode with the transistor collector, and (ii) a smoothing capacitor that has its opposite side joined with the transistor emitter.

3,577,017
RECTANGULAR PULSE MODULATOR

Jimmy R. Duke, and Walter E. Miller, Jr., Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army

Filed Dec. 17, 1968, Ser. No. 784,443
Int. Cl. H03k 3/35
U.S. Cl. 307—284 2 Claims

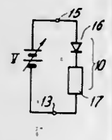


Discharge of a RLC network is controlled with a silicon-controlled rectifier to provide a rectangular pulse for pulsing GaAs lasers.

3,577,018
HIGH-SPEED LOGIC DEVICE EMPLOYING A GUNN-EFFECT ELEMENT AND A SEMICONDUCTOR LASER ELEMENT

Toshio Wada; Yasuo Matsukura, and Kuniichi Ohta, Tokyo, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Mar. 13, 1969, Ser. No. 806,830
Claims priority, application Japan, Mar. 15, 1968, 43/17141
Int. Cl. H01l 19/00
U.S. Cl. 307—299 12 Claims

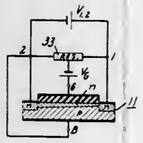


A semiconductor device is described wherein a Gunn effect element is placed in series with the PN junction of a semiconductor laser. A bias potential is applied across the series connection to forwardly bias the PN junction and normally produce lasing action from the laser element. The bias potential is further selected so that current reductions produced by high electric field layers traveling within the Gunn element effectively suppress lasing actions. Several embodiments are shown.

3,577,019
INSULATED GATE FIELD EFFECT TRANSISTOR USED AS A VOLTAGE-CONTROLLED LINEAR RESISTOR

Herbert F. Storm, Delmar, N.Y., assignor to General Electric Company

Filed Sept. 24, 1968, Ser. No. 762,091
Int. Cl. H03k 3/26
U.S. Cl. 307—304 4 Claims

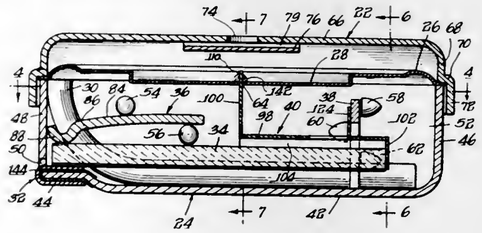


The channel resistance of a metal-oxide-semiconductor field-effect transistor, or other insulated gate field effect transistor, is linearized by applying to the gate electrode, in addition to the gate voltage for controlling the conductivity, an external feedback voltage having a value of one-half the supply voltage to nullify the effect of the internal feedback due to the supply voltage. In some cases the base electrode is disconnected, but spurious effects caused thereby can be avoided. The voltage-controlled linear resistor can be employed in DC and AC circuits in applications such as an AC phase shift circuit.

3,577,020
ACCELERATION INSENSITIVE TRANSDUCER

Elmer Victor Carlson, Prospect Heights; Floyd Warren Cross, Wheaton, and Mead Clifford Killion, Elk Grove Village, Ill., assignors to Industrial Research Products, Inc., Elk Grove Village, Ill.

Continuation of application Ser. No. 550829, May 17, 1966, now abandoned. This application June 17, 1969, Ser. No. 835,304
Int. Cl. H04r 17/00
U.S. Cl. 310—8.2 10 Claims

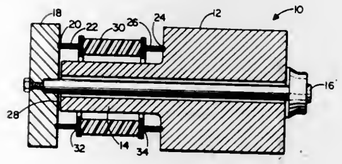


A transducer which includes a conductive case and an apertured cover mounted on the case. A baffle plate is mounted adjacent to the aperture. A diaphragm is mounted on the case. A piezoelectric element is mounted within the case and is held in position by a resilient conductive clip which is stressed beyond its elastic limit. A lever attached to a fixed pivot connects the piezoelectric element with the diaphragm and has balanced effective moments due to inertia on opposite sides of the pivot.

3,577,021
PIEZOELECTRIC TRANSDUCER MOUNTING APPARATUS

Irvin F. Gerks, Winslow, Wash., assignor to Honeywell, Inc., Minneapolis, Minn.

Filed Jan. 29, 1969, Ser. No. 795,016
Int. Cl. H01v 7/00
U.S. Cl. 310—8.7 3 Claims

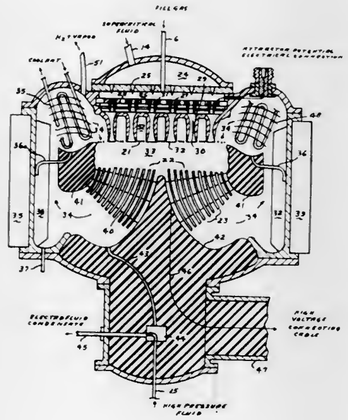


A method of and apparatus for mounting a ceramic transducer to substantially reduce stresses produced therein as a result of its operation or external forces. The improvement comprises cylindrical rings which, while having high axial stiffness, have relatively low radial stiffness and therefore allow the transducer to flex or expand radially with respect to the mounting means while being axially held in place.

3,577,022
THERMOBALLISTIC GENERATOR

Siegfried H. Hasinger, Dayton, Ohio, assignor to the United States of America as represented by the Secretary of the Air Force

Filed Jan. 6, 1970, Ser. No. 001,005
Int. Cl. H02n 3/00
U.S. Cl. 310—10 7 Claims



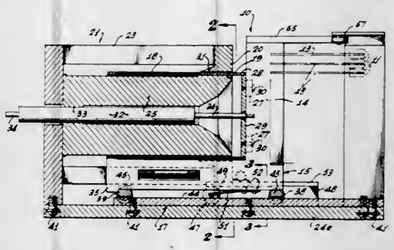
Jets of high energy supercritical steam in a disintegrated state containing a small percentage of conductive colloidal particles are inductively electrically charged, then evaporated, in a fillgas mixture of steam and hydrogen transferring electrical charge to the colloids. After the evaporation the hydrogen and water vapor carrying the charged colloids are accelerated to a supersonic speed in expansion nozzles such that a wet vapor condition occurs and condensation takes place with the charged colloids acting as condensation nuclei. The condensation nuclei are kept from contacting the expansion nozzle walls by a sheath composed of the fillgas. The charged condensation droplets at constant or with slightly increased environmental pressure then traverse a conversion space of suddenly increased cross section of determined size, from a ground potential plane to a plurality of collector electrode plates converting an essential part of their kinetic energy into electrical energy. They deposit their electrical charge thereon raising the collector to a high potential. Recirculation of hydrogen and steam through the conversion region assists in the conversion process as a cooling and transport medium. Electrical power at relatively high voltages and low currents between the collector electrode and ground potential is generated for utilization.

3,577,023
MOVING COIL ACTUATOR

Lewis W. Bleiman, Northridge, Calif., assignor to Advanced Peripherals, Inc., Van Nuys, Calif.

Filed Dec. 4, 1969, Ser. No. 882,108
Int. Cl. H02k 41/02
U.S. Cl. 310—13 15 Claims

A moving-coil actuator having a carriage with an upright supporting post and an elongated undercarriage extending in one direction along a track for supporting the carriage. An electrical coil mounted on one side of the post projects in the same direction as the undercarriage into an annular air gap in a permanent magnet assembly, the undercarriage projecting into the assembly through a slot therein, and a plurality of head-supporting arms project in the opposite direction from the post into a stack of memory discs. Roller bearings adjacent the opposite ends of the undercarriage ride on inclined ways on the track, and a holddown bearing assembly is spring urged upwardly to ride along overlying ways. One element of an optical position-determining device is rigidly mounted on

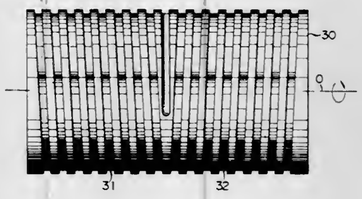


the undercarriage to coact with fixed elements on the actuator to determine the position of the carriage.

3,577,024
LIQUID-COOLED DYNAMOELECTRIC MACHINES

Junpei Inagaki; Moriyoshi Sakamoto, Yokohama-shi; Tsuneo Nakaita, Kawasaki-shi, and Hiroyuki Kitamura, Yokohama-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed Sept. 29, 1969, Ser. No. 861,602
Claims priority, application Japan, Oct. 1, 1968, 43/70872
Int. Cl. H02k 9/19
U.S. Cl. 310—54 1 Claim

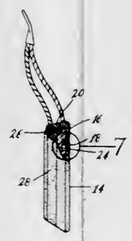


In a liquid-cooled dynamoelectric machine comprising a stator, a rotor, and means to spray cooling liquid directly upon heated portions of the stator, the peripheral surface of the rotor is provided with a pair of oppositely directed helical grooves or a pair of oppositely inclined surfaces to create components of force which act to prevent the cooling liquid from entering into the airgap between the stator and the rotor.

3,577,025
CLIP FOR CARBON BRUSHES

Archie R. Kingsbury, Taylors, S.C., assignor to Union Carbide Corporation

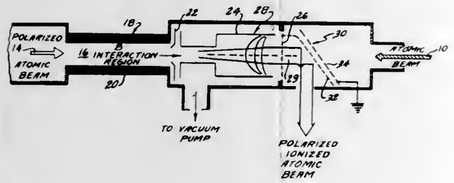
Filed June 7, 1968, Ser. No. 735,348
Int. Cl. H02k 13/00
U.S. Cl. 310—239 11 Claims



A clip for use with carbon brushes to form an assembly suitable to operate in electric equipment, the clip having at

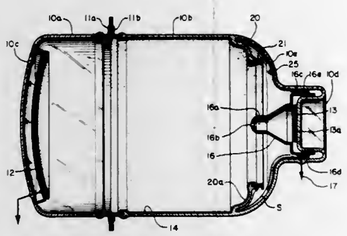
least two members, one of the members being provided with a resilient protruding segment. This segment moves to a position flush with the surface of the member to which it is secured while the clip is sliding into a groove in the carbon brush, and snaps back to its normal position when it engages a recess in the groove. With this construction, the clip is permanently secured to the brush.

3,577,026
METHOD FOR PRODUCING IONS UTILIZING A CHARGE-TRANSFER COLLISION
Willy Haeberli, Madison, Wis., assignor to the United States of America as represented by the United States Atomic Energy Commission
Filed June 24, 1969, Ser. No. 836,088
Int. Cl. H01j *27/00*
U.S. Cl. 313—63 **12 Claims**



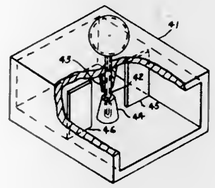
Ionization of a first beam of polarized neutral atoms is accomplished by a charge-transfer collision with a second beam of atoms.

3,577,027
LOW NOISE IMAGE INTENSIFIER
Constantin S. Szegho, Chicago, Ill., assignor to Zenith Radio Corporation
Filed Aug. 30, 1968, Ser. No. 756,443
Int. Cl. H01j *39/00, 1/52*
U.S. Cl. 313—101 **8 Claims**



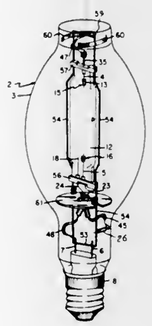
An image intensifier of otherwise conventional construction is improved by an inwardly directed extension of the envelope, projecting from one edge of the focus electrode and extending toward the anode. The focus electrode is a conductive coating on the internal surface of the envelope and is, in effect, extended by a conductive coating applied to the inwardly facing surface of the envelope extension. That extension terminates in a metal ring. With the structure, the surface separation or leakage path between the metal ring termination of the focus electrode and the anode is substantially greater than that otherwise existing between those electrodes. The increased separation of these electroue elements along the surface of the envelope minimizes the tendency toward field emission and its contribution to background noise. A high resistance coating or an electron shield protects the shoulder of the envelope from electron bombardment and eliminates that source of background noise.

3,577,028
CHLORINE-OXYGEN TRANSMIT-RECEIVED STAGE TO OPERATE AT SHORT PULSE WIDTHS, LOW PULSE REPETITION FREQUENCIES, AND WIDE DUTY CYCLES
Harry Goldie, Randallstown, Md., assignor to the United States of America as represented by the Secretary of the Air Force
Filed Sept. 30, 1969, Ser. No. 862,203
Int. Cl. H01j *17/20*
U.S. Cl. 313—223 **1 Claim**



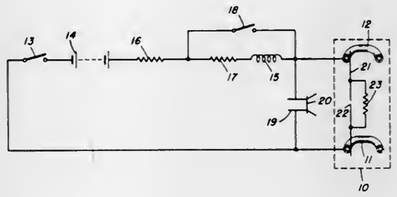
The invention consists of a mixture of chlorine gas, (Cl_2), and oxygen gas, (O_2), to be used in place of pure Cl_2 gas in transmit-receive stages for stable operation at shorter radio frequency pulse widths, lower pulse repetition frequencies and wider duty cycles than was previously possible with Cl_2 gas alone. The mixture reduces the power necessary for ionization of the gas in the stage which decreases the random amplitude modulation on the leakage envelope and reduces the total spike energy output to the receiver making it possible to use more sensitive receivers without danger of their being damaged by spike leakage. The invention also provides a much faster recovery time than is possible with a mixture of Cl_2 gas and noble gas which yields the same leakage as that of the invention.

3,577,029
HIGH-PRESSURE ELECTRIC DISCHARGE DEVICE CONTAINING MERCURY, HALOGEN, SCANDIUM AND SAMARIUM
Frederic Koury, Lexington, and John F. Waymouth, Marblehead, Mass., assignors to Sylvania Electric Products, Inc.
Filed Nov. 29, 1968, Ser. No. 780,117
Int. Cl. H01j *61/18*
U.S. Cl. 313—229 **6 Claims**



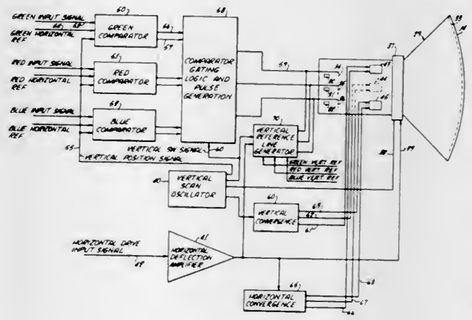
A metal arc lamp, which emits all visible colors in the spectrum and has good red rendition, contains a fill including mercury, halogen, scandium and samarium. The lamp is an efficient producer of white light.

3,577,030
INDUCTIVE ENERGIZING CIRCUIT FOR ARC PLASMA GENERATOR
Richard T. Cusick, Laurel, and Edgar A. Bunt, Kensington, Md., assignors to the United States of America as represented by the Secretary of the Navy
Filed Oct. 30, 1967, Ser. No. 678,973
Int. Cl. H01j *7/24*
U.S. Cl. 315—111 **6 Claims**



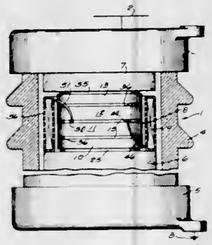
The present invention generally relates to a method and apparatus for controlling the running, as well as the starting and shut-down operations, of a shutdown arc plasma generator or the like whose spaced-apart electrodes are energized from a circuit including an inductor which is connected in series with the electrodes and their energizing voltage source and which functions to damp out current pulsations, particularly those occurring at high mass flow rates within the arc plasma generator. Moreover, by maintaining the electrode arc discharge current constant, the arc rotation rate is also more uniform. Due to the fact that the series inductor causes current buildup in the electrode energizing circuit to be a function of time, suitable means are provided for delaying the establishment of the electrode arc discharge until such time as the circuit current has been built up sufficiently to insure that the arc discharge will be sustained. Moreover, means are also provided for decoupling the inductor from the remainder of the electrode energizing circuit, prior to the time when the electrode energizing circuit is open-circuited, so as to prevent arcing at the switch or circuit breaker means utilized to open the electrode energizing circuit.

3,577,031
MULTICOLOR OSCILLOSCOPE
Neil R. Welsh, and Richard E. McCormick, Dana Point, Calif., assignors to Telonic Industries, Inc., Laguna Beach, Calif.
Filed July 7, 1969, Ser. No. 839,240
Int. Cl. H01j *29/50, 29/52, 29/72*
U.S. Cl. 315—13 **23 Claims**



An oscilloscope employing a multibeam, multicolor cathode-ray tube in which each of several input signals are displayed in a different color on the cathode-ray tube screen. The electron beams are rapidly scanned along the vertical axis to produce a vertical raster. Plural horizontal reference lines are displayed in discrete colors simultaneously with the signal traces by displaying the reference lines and input signals as colored dots by individually intensity modulating the plural electron beams during their alternate up and down scans. Plural vertical reference lines are displayed in discrete colors simultaneously with the signal traces and the horizontal reference lines by energizing each of the beams for a single vertical trace at a predetermined position along the horizontal screen axis. Convergence circuits correct for both vertical and horizontal convergence, the horizontal convergence circuit being adapted to correct for convergence for differing horizontal drive waveforms. A vertical scan oscillator including a resonant circuit incorporating the vertical deflection coil provides a high frequency, high voltage scan without requiring large voltages across the amplification stage.

3,577,032
SERIES GAP LIGHTNING ARRESTER WITH ARC EXTINGUISHING CHAMBERS
Darrel D. McStrack, New Berlin, and Lawrence M. Barrage, South Milwaukee, Wis., assignors to McGraw-Edison Company, Milwaukee, Wis.
Filed Nov. 22, 1968, Ser. No. 778,060
Int. Cl. H01t *1/04, 5/02*; **H02h** *1/04*
U.S. Cl. 315—36 **25 Claims**



This disclosure relates to an overvoltage spark gap protective apparatus having a series of arc gaps each within a spark gap chamber in combination with an outer coil to elongate the arcs. Each chamber houses a pair of spaced electrodes disposed nonsymmetrically therein to define an arc extension or elongating chamber to the one side of the electrodes. The walls of the confining chamber are formed of a semiconductor with a rough surface and are contoured to define a decreasing cross section with terminates in a narrow sidewall in the outer edge of the arc-elongating chamber. The outer end portion of the confining chamber, and particularly at the narrow sidewall, is connected by suitable vent passageway means to the exterior of the apparatus. The electrodes are mounted within an arcuate wall and secured thereto by an anchor lug along which the arc root moves from the electrode. A single wire magnetic coil is wound concentrically about the spark gap chamber and is connected in series with the protective arc gap electrodes. The coil serves to elongate the arc into the confining chamber and outwardly to the narrow sidewall.

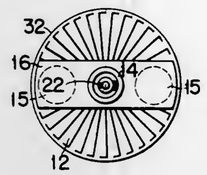
ERRATUM

For Class 315—39 see:
Patent No. 3,577,207

3,577,033
MAGNETRON DEVICE WITH COOLING FLUID FLOW IN LONGITUDINAL DIRECTION OF MAGNETRON TUBE
Ichiro Aoki; Kenji Iwasaki, Yokohama-shi; Tamaji Yoshihashi, Fukaya-shi; Tokuju Koinuma, Kawasaki-shi; Masao Kato, and Akihiro Fukatu, Yokohama-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Mar. 13, 1969, Ser. No. 806,975
Claims priority, application Japan, Mar. 18, 1968, Nov. 20, 1968, 43/20768;43/100759
Int. Cl. H01j *7/26, 25/50*
U.S. Cl. 315—39.71 **5 Claims**

In a magnetron device including a magnetron tube and a

permanent magnet, cooling means is provided for cooling the magnetron tube and magnet, the cooling means defining

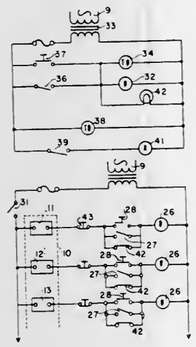


cooling fluid flow paths in a direction substantially in parallel with the longitudinal axis of the magnetron tube.

ERRATUM

For Class 317—2 see:
Patent No. 3,577,208

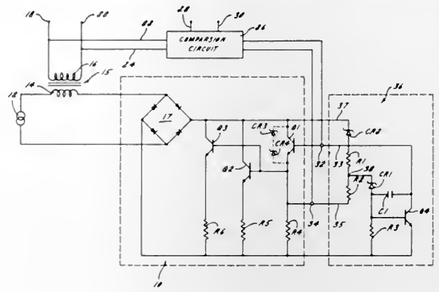
3,577,034
POWER INTERRUPTION CONTROL SYSTEM
George D. Bernhard, Lincoln Park, and Olek Schwarz, Plainfield, N.J., assignors to Anaconda Wire and Cable Company
Filed Sept. 29, 1969, Ser. No. 861,882
Int. Cl. H01h *47/18*
U.S. Cl. 317—22 **4 Claims**



Where a plurality of processing operations are powered from a common electrical supply, shutdown of the operations by momentary interruptions of power is prevented by timing a main circuit relay not to open unless the interruption has a preselected time duration, shorting individual switches that have opened due to the interruptions, and breaking such shorts soon after the power has resumed.

3,577,035
POWER TRANSISTOR PROTECTION CIRCUIT
James M. Constable, Flushing, N.Y., assignor to Del Electronics Corp., Mount Vernon, N.Y.
Filed June 11, 1968, Ser. No. 736,231
Int. Cl. H02h *3/08, 3/20*
U.S. Cl. 317—31 **12 Claims**

A protection circuit is operatively connected to a power transistor in a power supply control circuit. Means are provided to derive signals representative of the current flow through the power transistor and to the voltage across that transistor, and to sum those signals. At excessive, unsafe current and voltage levels in the power transistor, that sum will

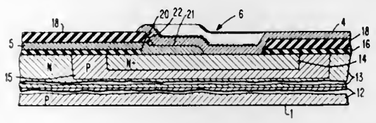


exceed a predetermined value, and will be effective to decrease the current flowing through the power transistor.

ERRATUM

For Class 317—98 see:
Patent No. 3,577,209

3,577,036
METHOD AND MEANS FOR INTERCONNECTING CONDUCTORS ON DIFFERENT METALIZATION PATTERN LEVELS ON MONOLITHICALLY FABRICATED INTEGRATED CIRCUIT CHIPS BY ALLOYING AN INTERCONNECTION PORTION OF EACH CONDUCTOR TO CONTIGUOUS PORTIONS OF ONE LOW RESISTIVITY REGION OF THE CHIP
John J. Curtis, Endwell, N.Y., and Carl E. Ruoff, Boston, Mass., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 5, 1969, Ser. No. 821,592
Int. Cl. H01l *19/00*
U.S. Cl. 317—101 **8 Claims**

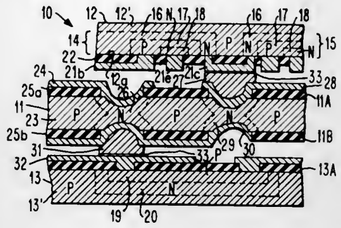


Minimum connection area and maximum reliability over long periods of use are achieved with the improved technique for interconnecting two-level metalization patterns overlying monolithic integrated circuit chips. A pair of metal conductors from each of two levels are joined to each other and are further separately joined to contiguous portions of an isolated low resistivity region in the chip. It has been found that each connection between metalization patterns of two different levels can be effected in an area as small as approximately two-tenths mil by five-tenths mil.

3,577,037
DIFFUSED ELECTRICAL CONNECTOR APPARATUS AND METHOD OF MAKING SAME
Americo R. Di Pietro, Katonah, N.Y., and Rudolf E. Thun, Carlisle, Mass., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed July 5, 1968, Ser. No. 742,886
Int. Cl. H01l *19/00*
U.S. Cl. 317—101 **1 Claim**

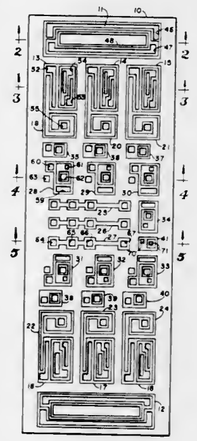
An electrical connector having first and second metallization conductive patterns disposed on two faces, respectively, of a semiconductor substrate and one or more diffused interconnections within the substrate for connecting the conductive patterns in a predetermined manner. Circuit apparatus

having at least two semiconductor substrates, each of which has a plurality of integrated circuits of the monolithic type,



and each of which is mounted on a mutually exclusive face of the aforementioned diffused electrical connector.

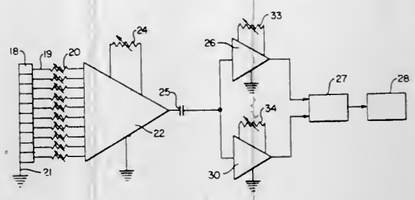
3,577,038
SEMICONDUCTOR DEVICES
Charles R. Cook, Jr., North Palm Beach, Fla., assignor to Texas Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 595,532, Nov. 18, abandoned, which is a continuation of Ser. No. 221,409, Aug. 31, 1962, abandoned.
Sept. 4, 1968, Ser. No. 757,438
Int. Cl. H01l *19/00*
U.S. Cl. 317—101 **9 Claims**



A large number of different types of circuits made from a single semiconductor wafer configuration by varying the manner in which connections and leads are provided to the various regions of the wafer. A plurality of different circuit elements such as transistors, diodes, resistors and capacitors, are formed in a wafer semiconductor material, preferably by diffusion into the surface of a major wafer. These elements are arranged in a pattern adjacent the major face, with each region or electrode of each element coming to the surface at this face so that electrical connection may be made thereto. An insulating coating is provided on the major face of the wafer, with holes being formed in the coating where contacts are to be made, and conductive material is preferably deposited first over the entire face of the wafer and is later removed in a selected pattern to create the interconnections between components necessary for the selected circuit.

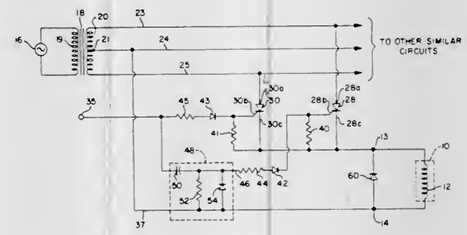
3,577,039
OPTICAL APPARATUS FOR FLAW DETECTION
Norman R. Sanford, Dayton, Ohio, and Heinrich J. Wieg, New Burlington, Ohio, assignors to The Bendix Corporation
Filed Jan. 28, 1969, Ser. No. 794,526
Int. Cl. H01h *47/24*
U.S. Cl. 317—127 **7 Claims**

There is disclosed an optical apparatus for flaw detection in which a traveling line of light is reflected from the surface of an object to an array of photocells. The outputs of the photocells are combined in a summing amplifier and changes in the output of the summing amplifier exceeding some predetermined amount above or below a normal value are



used as a control or reject signal. Each of the individual photocells is compensated so that the same relative amount of change in the cell's light input produces the same amount of change in the signal seen at the output of the summing amplifier.

3,577,040
SOLENOID CONTROL CIRCUIT
Richard H. Campbell, Jr., Gilford, N.H., assignor to Pneumo Dynamics Corporation, Cleveland, Ohio
Filed Sept. 26, 1968, Ser. No. 762,723
Int. Cl. H02m *7/44*; **H01h** *47/32*
U.S. Cl. 317—148.5 **3 Claims**

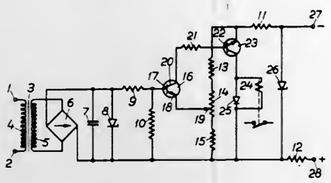


An electronic circuit for actuating a solenoid load from an AC power source in a two-step sequence wherein a high DC voltage is initially applied to "pull-in" the solenoid armature and a lower voltage maintains the armature in a "hold" condition. Silicon-controlled rectifiers (SCR's) provide an electronic switching and rectification of the voltage for operating power. The circuit is controlled by an electrical signal which conditions the SCR's to provide operating voltage during alternate half cycles of the power source and a time delay circuit allows conduction of the "pull-in" SCR for only a few cycles of the power source.

3,577,041
OVERCURRENT RELAY CIRCUIT
Arne Kring, and Arne Johansson, Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Mar. 10, 1969, Ser. No. 805,758
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 **3 Claims**

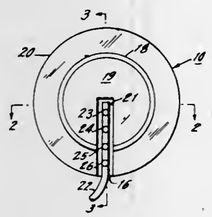
An overcurrent relay circuit, the pickup value of which is substantially independent of the DC-component in an asymmetrical alternating current, has an input transformer, the magnetic circuit of which is provided with air gaps while the secondary load of this transformer is high-resistive. To the

secondary winding of the transformer is connected a rectifier with a smoothing device connected to level-sensing circuit



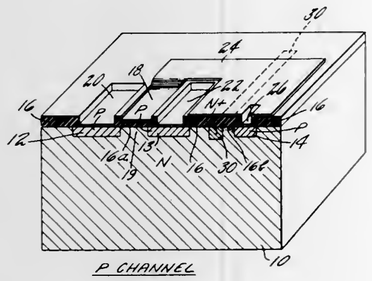
and an output magnetic relay in the output circuit of the level-sensing circuit.

3,577,042
GATE CONNECTION FOR CONTROLLED RECTIFIERS
Thomas J. Roach, Palos Verdes Estates, Calif., assignor to International Rectifier Corporation, El Segundo, Calif.
Filed June 19, 1967, Ser. No. 647,038
Int. Cl. H01l *1/14, 11/10*
U.S. Cl. 317—235 **6 Claims**



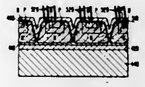
A gate lead wire is connected to the third layer of a four-layer semiconductor wafer at a plurality of spaced regions. The wire is received in a slot in the upper expansion plate and extends from the center of the wafer and outwardly.

3,577,043
MOSFET WITH IMPROVED VOLTAGE BREAKDOWN CHARACTERISTICS
Robert C. Cook, Worcester Township, Pa., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Dec. 7, 1967, Ser. No. 688,766
Int. Cl. H01l *11/14, 19/00*
U.S. Cl. 317—235R **1 Claim**



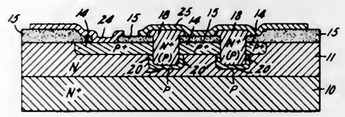
A low resistivity impurity barrier prevents inversion layer conduction between a MOSFET protection diode and the source (or drain). Adjusting the spacing and impurity gradient between the impurity barrier and the protection diode results in control over reverse bias breakdown between the diode impurity and the low resistivity barrier, rather than with the substrate, whereby a lower, controlled breakdown voltage may be achieved.

3,577,044
INTEGRATED SEMICONDUCTOR DEVICES AND FABRICATION METHODS THEREFOR
William J. Armstrong; Albert M. Healy, Essex Junction, Vt., and Michael C. Duffy, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Division of Ser. No. 532,754, Mar. 8, 1966, Pat. No. 3,476,224, Dec. 17, 1968. Filed Apr. 8, 1968, Ser. No. 758,166
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 **6 Claims**



This invention is directed generally to integrated semiconductor devices including fabrication methods therefor and, more particularly, to insulator encapsulated, dielectrically isolated, integrated semiconductor devices including fabrication methods therefor.

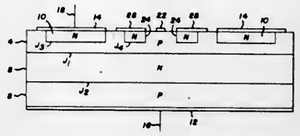
3,577,045
HIGH EMITTER EFFICIENCY SIMICONDUCTOR DEVICE WITH LOW BASE RESISTANCE AND BY SELECTIVE DIFFUSION OF BASE IMPURITIES
William E. Engeler, Scotia, and Marvin Garfinkel, Schenectady, N.Y., assignors to General Electric Company
Filed Sept. 18, 1968, Ser. No. 760,526
Int. Cl. H01l *3/00*
U.S. Cl. 317—235 **14 Claims**

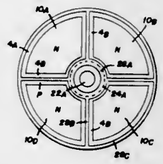


A transistor, such as NPN type, for example, is fabricated by first diffusing a heavily doped P-type base contact region into an N-type semiconductor layer epitaxially grown on a heavily doped N-type semiconductor wafer. Holes are etched through the base contact region into the N-type layer and strongly N-type semiconductor material containing both N-type impurities and faster diffusing P-type impurities is epitaxially grown so as to fill the holes. The wafer is then heated to diffuse the P-type impurities so as to form a base region of controlled thickness, simultaneously forming emitter-base and base-collector junctions. Emitter contact is made by contacting the material epitaxially grown in the holes. Other type semiconductor devices, such as semiconductor controlled rectifiers, may also be fabricated in this manner.

3,577,046
MONOLITHIC COMPOUND THYRISTOR WITH A PILOT PORTION HAVING A METALLIC ELECTRODE WITH FINGER PORTIONS FORMED THEREON
Joseph Moyson, Union Springs, N.Y., assignor to General Electric Company
Continuation-in-part of application Ser. No. 741,675, July 1, 1968, now abandoned. This application Mar. 21, 1969, Ser. No. 809,076
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235R **3 Claims**

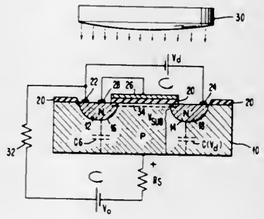
A silicon-controlled rectifier or thyristor is provided having a control signal responsive pilot portion functionally separated from, though structurally monolithic with, a main current carrying portion. Turning on of the pilot portion is controlled by a gate or control signal and the resulting pilot current through the pilot portion provides a high energy turn-on signal for the main portion, thereby enabling optimum





turn-on efficiency to be designed into the pilot portion while preserving high current carrying capacity in the main portion, with resulting high *di/dt* and *dv/dt*. The turn-on signal from the pilot thyristor may be distributed over a wide area of the main thyristor.

3,577,047
FIELD EFFECT DEVICE
George Cheroff, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 15, 1969, Ser. No. 791,254
Int. Cl. H01l *1/14*
U.S. Cl. 317—235 **5 Claims**



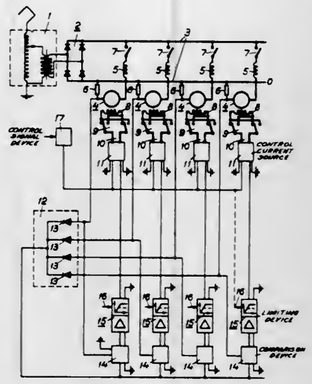
A field-effect device is provided which comprises a field effect transistor of the insulated gate type. The device is capable of being used as a photodetector with a gain greater than unity. To this end, the transistor is biased in the "off" state by a substrate potential (source-to-substrate) resulting from the provision of an external voltage supply in the source-to-substrate loop. Upon the radiation of the source and drain junctions in the transistor, a current is caused to flow between the source and drain electrodes which result in a current gain in excess of unity.

ERRATUM

For Class 317—235 see:
Patent No. 3,577,210

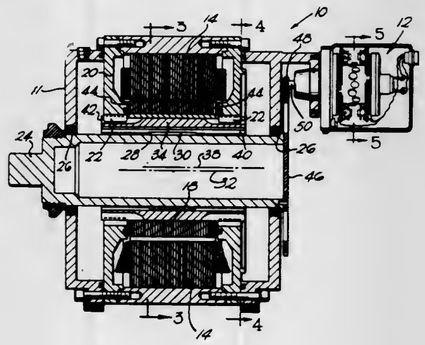
3,577,048
PLURAL MOTOR ANTISLIP DRIVE CONTROL
Tore Nordin, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Dec. 26, 1968, Ser. No. 787,182
Claims priority, application Sweden, Dec. 27, 1967, 17793/67
Int. Cl. B61c *15/08*
U.S. Cl. 318—52 **2 Claims**

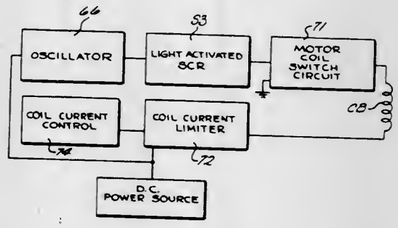
A driving system for an electric locomotive has a plurality of parallel-connected direct current motors each connected to a pair of wheels and connected by their armature windings to a variable alternating current source by a rectifier. Each motor has a field winding connected to a control current source to receive signals from the source to reduce the field. Each armature circuit feeds to a selection device a mag-



nitude proportional to the armature current. The selection device selects the greatest of these magnitudes, which is compared with each of the magnitudes proportional to the armature current, which signal is then fed to the field winding. The control signal is maintained below a certain maximum value.

3,577,049
SELF-COMMUTATED ELECTROMOTIVE DEVICE
Joseph P. Madurski, Royal Oak; Rex W. Presley, Livonia, and Ralph W. Rothfusz, Southfield, Mich., assignors to The Bendix Corporation
Filed Sept. 26, 1967, Ser. No. 670,726
Int. Cl. H02k *29/00*
U.S. Cl. 318—138 **15 Claims**





An electromotive device including a stator provided with electromagnets, an eccentric armature mounted for move-

ment by the electromagnets, and an output member which is concentric with the stator and is driven by the armature movement. A light-actuated electromagnet commutation system is disclosed. The armature of the electromotive device has epicyclic movement relative to both the stator and the output member with the two epicyclic movements cooperating to provide an integrated motor transmission unit.

3,577,050

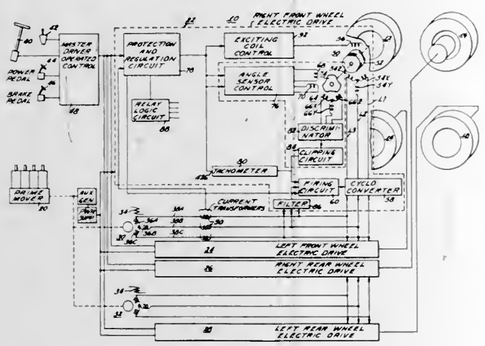
VEHICLE DRIVEN BY SYNCHRONOUS MOTORS

William L. Ringland, Greendale; Manfred E. Neumann, New Berlin; Ernst K. Kaeser, West Allis; Thomas P. Gilmore, Wauwatosa, and Allois F. Geiersbach, Milwaukee, Wis., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Aug. 27, 1969, Ser. No. 853,462

Int. Cl. H02p *5/22*

U.S. Cl. 318—146 **58 Claims**



The wheels of a vehicle are driven by inductor type synchronous motors having solid rotors without windings and commutators. A diesel on the vehicle drives a pair of high frequency rotating generators each of which supplies power to a pair of the synchronous motors. Power pedal means actuated by the operator derive a power signal proportional to the desired tractive effort for the vehicle. A separate electric drive for each motor includes means for deriving a control signal modulated at motor speed, a cycloconverter between each motor and its generator regulated by the control signal, tachometer means for deriving a speed signal which is a function of motor speed, and control means responsive to both the power signal and speed signal for regulating the magnitude and phase of the control signal so that the motor output power is constant over the speed range at a level in accordance with the power pedal setting.

Brake means actuated by the operator derive a brake signal, and the vehicle has means for shifting the phase of the control signals for all the motors to regeneratively brake them when the brake signal exceeds the power signal. The vehicle has travel direction selector means for shifting the phase of all the control signals to reverse the direction of motor rotation and thus propel the vehicle backward. The vehicle has manually operated means for setting a speed limit for the vehicle and means for deriving a speed limit signal which is additive to the brake signal to regeneratively brake the motors when vehicle speed exceeds the set speed limit. Turn compensation means increase the power supplied to the motors of the wheels on the outside of a turn and decrease the power supplied to the motors of the wheels on the inside of the turn as a function of the degree of turn and the magnitude of the power signal.

3,577,051

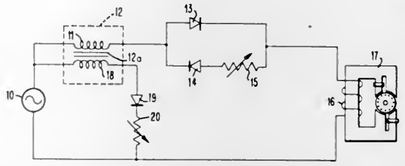
MOTOR SPEED CONTROL CIRCUIT HAVING VARIABLE REACTIVE IMPEDANCE MEANS

Herbert R. Montague, Binghamton, N.Y., assignor to Power Concepts Corporation, Hallstead, Pa.

Filed May 19, 1969, Ser. No. 825,617

Int. Cl. H02p *3/24*

U.S. Cl. 318—212 **5 Claims**



A speed control circuit for induction motors, such as the shaded-pole type, in which a pair of oppositely poled, parallel-connected diodes are connected between an alternating current source and the motor. There is a variable resistor in series with one of the diodes to vary the direct current component supplied to the motor and control the motor speed. A saturable reactor is included in series with the diodes to also vary the circuit impedance and thereby reduce the energy dissipation required at low motor speeds.

3,577,052

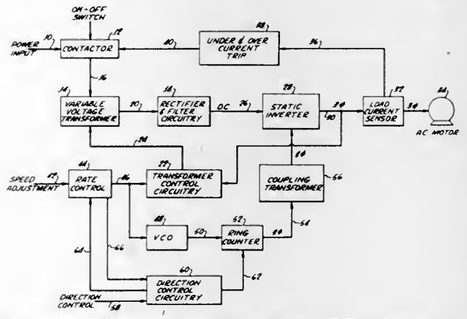
AC MOTOR CONTROL SYSTEM WITH SYNCHRONOUS SPEED CHANGE

David Elvis Bauer, 1800 W. Gromercy #21, Anaheim, Calif.

Filed Oct. 17, 1968, Ser. No. 768,295

Int. Cl. H02p *5/28, 5/40*

U.S. Cl. 318—230 **32 Claims**



A variable DC power source supplies a DC voltage to a static inverter which provides a three-phase alternating voltage output to drive an AC motor. A ring counter which is cycled by a voltage controlled oscillator generates three-phase timing signals to control the frequency of the inverter output. An input control signal is coupled to the voltage controlled oscillator through a rate control means. The rate control means generates a voltage output to the voltage controlled oscillator which is proportional to the input control signal and follows and adjustment of the input control signal from one level to another at a predetermined rate. The output generated by the rate control means also controls the magnitude of the DC voltage output of the DC power source. An adjustment of the input control signal results in a proportional change in the magnitude and the frequency of the inverter output.

3,577,053

BRUSHLESS DC MOTOR INCLUDING A VARIABLE ATTENUATOR FED COMMUTATOR

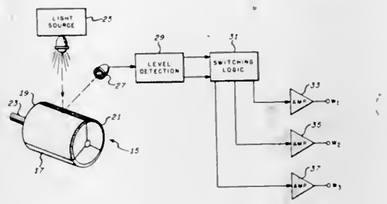
Joe H. McGee, Charlottesville, Va., assignor to Sperry Rand Corporation

Filed Feb. 17, 1969, Ser. No. 799,851

Int. Cl. H02k *29/02*

U.S. Cl. 318—254 **3 Claims**

A brushless DC motor includes a cylindrical reflecting member on the rotor. The cylindrical surface of the reflecting member is divided into arcuate sections equal in number to the number of stator coils in the motor, and each having a different level of reflectivity. Light from a stationary source illuminates the adjacent arcuate section and is reflected onto a stationary sensing element. The input to the sensing element is dependent upon the level of reflectivity of the section that happens to be adjacent the light source. A logic circuit directs the output of the sensing element to the particular stator coils corresponding to the intensity of light reaching the sensor at that time.



3,577,054

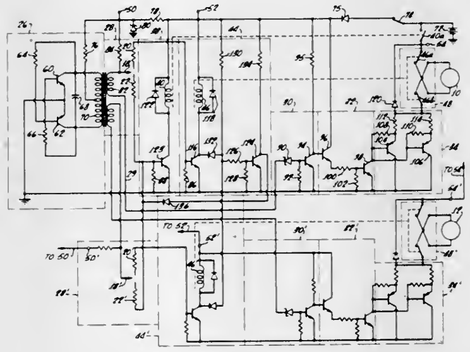
REVERSIBLE FAIL-SAFE WHEELCHAIR DRIVE CONTROL CIRCUIT

Roger W. Banks, Costa Mesa, Calif., assignor to Everest & Jennings, Inc.

Filed Jan. 24, 1969, Ser. No. 793,747

Int. Cl. H02p *1/22*

U.S. Cl. 318—257 **7 Claims**



A drive control circuit for a motorized wheelchair whereby the wheelchair occupant can select both the direction and the rate of motion of the chair by means of a joystick. In both directions the same motor control circuit is used. To prevent a runaway motor condition which might be caused by a component breakdown in the drive control circuit, means are provided to deenergize the wheelchair motor rapidly.

3,577,055

MEANS FOR REGENERATIVE BRAKING OF AN IMPULSE-CONTROLLED DIRECT CURRENT SERIES MOTOR

Fredrik Hermansson, deceased late of Sweden, by Ingrid Hermansson, Administrator, Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

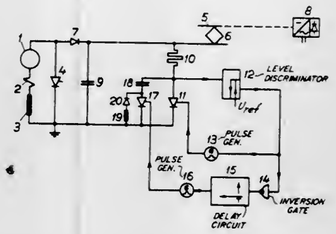
Filed June 3, 1968, Ser. No. 734,062

Claims priority, application Sweden, June 9, 1967, 8096/67

Int. Cl. H02p *5/04*

U.S. Cl. 318—302 **1 Claim**

An arrangement for regenerative braking of a thyristor-controlled DC series motor used as driving motor for street cars. During braking possible excess energy is consumed by a resistor connected in parallel with the motor. The resistor is connected in series with a switching means for connecting and disconnecting the resistor at an upper and lower voltage level, respectively.



3,577,056

DC MOTOR SERVOSYSTEM

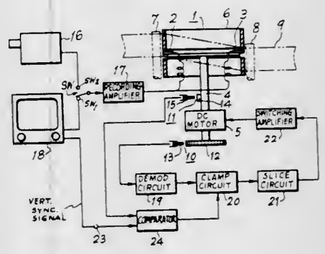
Kazunobu Tsujikawa, Tokyo, Japan, assignor to Sony Corporation, Shinagawa-ku, Tokyo, Japan

Filed Mar. 12, 1969, Ser. No. 806,352

Claims priority, application Japan, Mar. 13, 1968, 43/16283

Int. Cl. H02p *5/16*

U.S. Cl. 318—314 **6 Claims**



In order to control the phase and speed of a DC motor, particularly employed for driving the rotary magnetic heads of a video tape recorder, the output of a signal generator having a frequency corresponding to the rotational speed of the motor is fed through a demodulation circuit to a clamping circuit, and the rotational speed of the motor is controlled in accordance with variations in an output level resulting from the slicing of the output of the clamping circuit at a reference level. Simultaneously, the rotational position of the DC motor is detected and compared with an external reference signal, for example, the synchronizing signal of a television signal, and the clamp level of the clamping circuit is controlled by the output resulting from the comparison, thereby to drive the motor in synchronism with the external reference signal.

3,577,057

SYSTEM FOR CONTROLLING THE SPEED OF A MOTOR UTILIZING PULSE WIDTH MODULATION

George A. Dyer, Santa Ana, and Emil Kohler, Anaheim, Calif., assignor to North American Rockwell Corporation

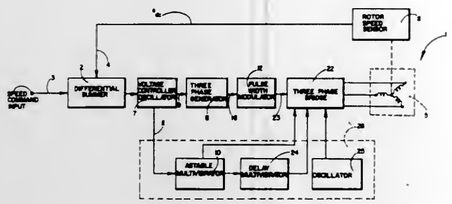
Filed Sept. 26, 1969, Ser. No. 861,397

Int. Cl. H02p *7/14*

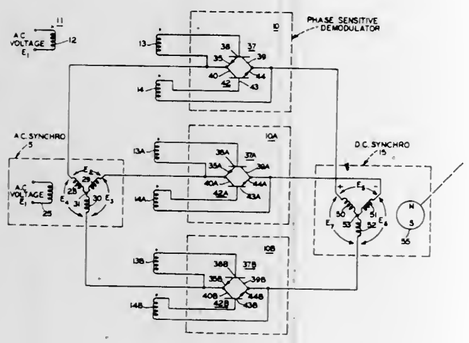
U.S. Cl. 318—328 **8 Claims**

An input voltage is summed with a voltage picked off from a polyphase motor for driving a voltage-controlled oscillator. The frequency of the output signal from the oscillator is dependent on the magnitude of the summed voltage. The pulse width is modified within a predetermined range as a function of the frequency and is converted into three phase signals

which are summed and applied to the stator windings of a motor. The signal across the windings has an optimum voltage and frequency ratio which is varied when the speed of the motor is changed.



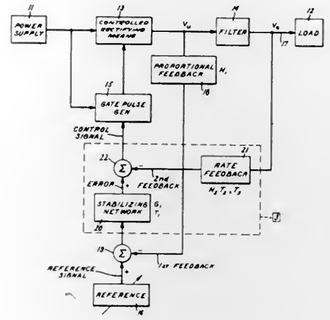
3,577,058
SELF-SYNCHRONOUS MOTOR CONTROL INCLUDING AN AC TRANSMITTER, A DC RECEIVER, AND A UNIQUE AMPLIFIER-DEMODULATOR
Richard L. Cohen, Old Bridge, N.J., assignor to The Bendix Corporation
Filed Dec. 19, 1968, Ser. No. 785,133
Int. Cl. G05b *1/12*
U.S. Cl. 318—691 **5 Claims**



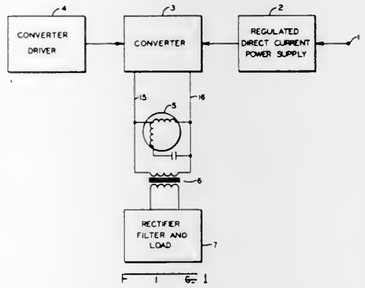
An indicating system including AC synchro transmitters providing AC signals corresponding to a condition. The AC signals are demodulated by phase-sensitive demodulators and the rectified signals are applied to DC synchro receivers operating an indicator for indicating the condition.

3,577,059
ELECTRIC POWER APPARATUS COMPRISING CONVERTER, FILTER, REGULATOR, AND MEANS FOR DYNAMICALLY STABILIZING THE FILTER
Fred W. Kelley, Jr., Media, Pa., assignor to General Electric Company
Filed Mar. 17, 1969, Ser. No. 807,867
Int. Cl. H02m *1/14, 7/12*
U.S. Cl. 321—10 **6 Claims**

In electric power apparatus including a voltage-regulated converter and a filter supplying a load circuit with relatively smooth unipolarity voltage of desired magnitude, the filter is stabilized by connecting rate feedback means to its output for deriving a negative feedback signal that dominates the dynamic response of the regulator to source or load disturbances.



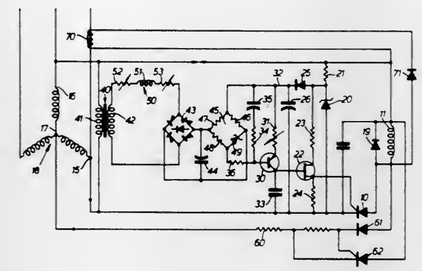
3,577,060
ALTERNATING CURRENT POWER SUPPLY EMPLOYING PROGRAMMED TURN-ON AND TURN-OFF
William E. Richeson, Jr., Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.
Filed Mar. 10, 1969, Ser. No. 805,729
Int. Cl. H02m *1/18;* **H02h** *7/14;* **H02m** *5/44*
U.S. Cl. 321—11 **6 Claims**



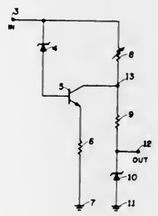
A reliability of a high-power alternating power supply wherein a low-power alternating current is used to convert a high-power direct current to said high-power alternating current is improved, when driven by sources and when driving loads that are inductive or inductively coupled, by the use of a programmed turn-on and turnoff procedure wherein the energy supplied to a reactive load is gradually increased and diminished respectively.

3,577,061
CONTROL APPARATUS FOR ELECTRIC ALTERNATORS
Peter J. Wyles, Stamford, England, assignor to Newage Lyon Limited, Stamford, England
Filed July 19, 1968, Ser. No. 746,108
Claims priority, application Great Britain, July 19, 1967, 34274/67
Int. Cl. H02p *9/08, 9/14*
U.S. Cl. 322—27 **1 Claim**

In automatic regulating apparatus for an electric alternator a main thyristor is connected in series with an excitation winding across the alternator terminals and is controlled by a sensing circuit to which a signal corresponding to the alternator output voltage is passed. A saturable current transformer has a primary winding in the load circuit of the alternator and a secondary winding connected through a rectifier to the excitation coil to build up the excitation when the alternator has to start up under a permanently connected load, without interferring with control once the voltage has built up.



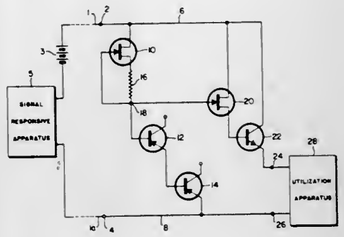
3,577,062
ZENER DIODE REFERENCE CIRCUIT INDEPENDENT OF INPUT VOLTAGE CHANGES
Eric J. Hoffman, Baltimore, Md.
Filed Feb. 19, 1969, Ser. No. 800,917
Int. Cl. G05f *1/44*
U.S. Cl. 323—8 **6 Claims**



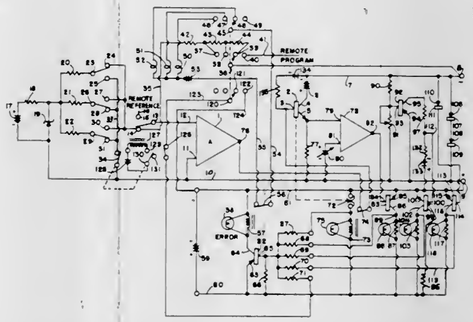
A Zener diode voltage reference circuit whose output is maintained at exactly the Zener voltage irrespective of changes in the input voltage. More particularly, since the voltage appearing across a Zener diode fluctuates slightly with changes in the Zener current, exact regulation is accomplished by maintaining the current flowing through the diode at a constant value; furthermore, the Zener current is held constant by adding to the circuit a second Zener diode which serves to extract from the first Zener diode all the current which would cause a voltage fluctuation.

3,577,063
VOLTAGE REGULATOR WITH INSIGNIFICANT CURRENT DRAIN
Edward T. E. Hurd, III, Willingboro, N.J., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Feb. 3, 1969, Ser. No. 795,886
Int. Cl. G05f *3/08*
U.S. Cl. 323—16 **5 Claims**

A voltage-regulating buffer, designed for use with a two-wire current signal transmitter, for limiting the line voltage which may be applied to the transmitter without adversely affecting the current signal from the transmitter. The buffer includes a series voltage-regulating element which is, in turn, controlled by a shunt control circuit. The shunt control circuit includes a series connected constant current unit and constant voltage unit.



3,577,064
AUTOMATIC ERROR DETECTION AND INDICATION IN A REMOTELY PROGRAMMABLE REGULATED POWER SUPPLY
Sarkis Nercessian, Long Island City, N.Y., assignor to Forbro Design Corp., New York, N.Y.
Filed Mar. 12, 1969, Ser. No. 806,385
Int. Cl. G05f *1/58*
U.S. Cl. 323—20 **12 Claims**

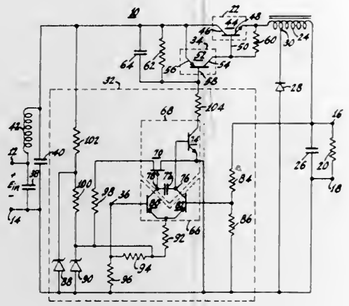


A programmable regulated power supply includes internal control circuits for determining the output voltage and digital visual read-out indicators showing the output voltage called for by the control circuits. In the operation of this power supply there are a number of predetermined circuit conditions which may result in the actual output voltage being different from the called for voltage. These conditions are detected and indicated individually and collectively. Certain of these conditions when detected serve to also extinguish the visual indicators.

3,577,065
SWITCHING REGULATOR HAVING A DIODE CONNECTED TO AN INTERMEDIATE TAP OF A CHOKE
Franz Ludwig Putzrath, and Charles Allan Michel, Haddonfield, N.J., assignors to RCA Corporation
Filed Nov. 21, 1968, Ser. No. 777,654
Int. Cl. G05f *1/56*
U.S. Cl. 323—22 **9 Claims**

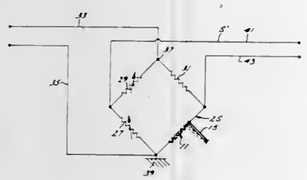
A switching regulator having a switching device, a choke and a load connected in series with a pair of input terminals. The regulator further includes a diode tapped back on the choke to prevent current spikes at the output. By tapping the diode back on the choke, a voltage is induced in the tapped

portion at the time the switch becomes short circuited and this voltage limits the current flowing through the switch dur-



ing the time necessary for the diode to become reversed biased.

3,577,066
ELECTRICAL CONTROL SYSTEM
Harold A. McIntosh, South Pasadena, Calif., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Mar. 7, 1969, Ser. No. 805,138
Int. Cl. G05f *3/02*; **G01r** *17/02*
U.S. Cl. 323—69 **6 Claims**

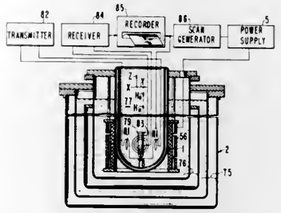


An electrical control system for controlling a function and comprising a flexible, variable resistor formed to provide a plurality of adjacent portions in heat exchange relationship with one another and adapted to move toward or away from one another, depending upon the direction of flexing of the resistor. The variable resistor is flexible axially to adjust the spacing between the adjacent portions to thereby vary the mutual heat transfer therebetween. This moves the electrical resistance of the flexible resistor to effect changes in the rate of current flow therethrough. A control means in circuit with the resistor is operative in response to said current changes to control the function.

3,577,067
PERSISTENT MODE SUPERCONDUCTIVE ORTHOGONAL GRADIENT CANCELLING COILS
Harry E. Weaver, Jr., Portola Valley, Calif., assignor to Varian Associates, Palo Alto, Calif.
Filed May 11, 1966, Ser. No. 549,353
Int. Cl. G01n *27/28*
U.S. Cl. 324—0.5 **5 Claims**

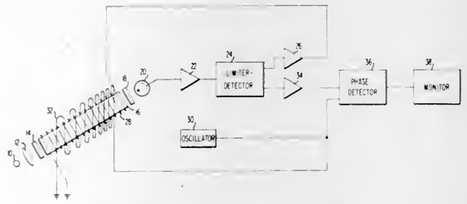
A superconductive magnet is disclosed together with superconductive gradient cancelling coils for homogenizing the magnetic field produced by the magnet. A gyromagnetic spectrometer is also disclosed which employs the magnetic field produced by the superconductive magnet. The gradient cancelling coils include a plurality of turns of a superconductor arranged adjacent the region of the magnetic field to be corrected, such magnetic field having certain residual magnetic field gradients therein to be cancelled.

Means are provided for energizing the gradient cancelling coils with electrical currents in such a configuration as to define orthogonal superconductive gradient cancelling coils. A superconductive connection is formed across the ends of the coil structure for closing the superconductive circuit across the ends of the coil to form a closed superconductive circuit, whereby the superconductive gradient cancelling coils may be operated in a persistent mode for enhanced sta-



bility and reduced power consumption. In one embodiment, a DC transformer is provided which has a primary winding coupled to the main magnetic field of the magnet and a secondary winding which serves to energize the gradient cancelling coils. In this manner, the gradient cancelling field components change their intensity in proportion to changes in intensity of the main magnetic field to maintain a corrected field.

3,577,068
OPTICALLY PUMPED MAGNETIC GRADIOMETER
Richard C. La Force, Grosse Point, Mich., assignor to Atlantic Richfield Company
Filed Aug. 27, 1968, Ser. No. 755,599
Int. Cl. G01r *33/08*
U.S. Cl. 324—0.5 **7 Claims**

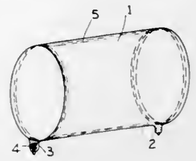


Apparatus for determining the gradient of the earth's magnetic field over a zone. The absorption magnetometer is encircled by a coil of wire coupled to a low frequency oscillator. The turns of the coil are unevenly spaced along the length of the cell and are canted with respect to the cell so that the magnetic field caused by current in the coil is inhomogeneous and offsets the gradient in the earth's magnetic field. The magnetometer's radio frequency output signal is amplitude modulated by a signal having the frequency of the oscillator output and having an amplitude proportional to the gradient of the earth's magnetic field. This modulation signal is amplitude detected and then phase detected using the oscillator output as a reference. The phase detector output is a signal indicative of the earth's magnetic field gradient.

3,577,069
OPTICAL RESONANCE CELLS CONTAINING AN ALLOY OF AN ALKALI METAL WITH ANOTHER METAL
Leon Malnar, and Henri Brun, Paris, France, assignors to CSF Compagnie Generale De Telegraphie Sans Fil
Filed Feb. 3, 1969, Ser. No. 796,355
Claims priority, application France, Feb. 5, 1968, 138,698
Int. Cl. G01r *33/08*
U.S. Cl. 324—0.5 **11 Claims**

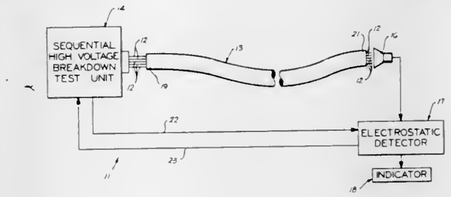
An optical resonance cell containing an alkali vapor to be optically pumped and comprising a bulb communicating with

the cell. An alloy of the alkali metal with another metal is placed in the bulb. This metal is so selected that the atoms of



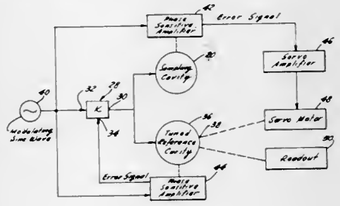
its vapor produce a disturbance as small as possible of the spin function of the alkali atoms, by spin exchange collisions.

3,577,070
METHODS OF AND SYSTEMS FOR PERFORMING TESTING OF CONDUCTORS FOR DEFECTIVE INSULATION AND CONTINUITY
Howard C. Whitekettle, Jr., Towson, Md., assignor to Western Electric Company Incorporated, New York, N.Y.
Filed Apr. 8, 1969, Ser. No. 814,341
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 **10 Claims**



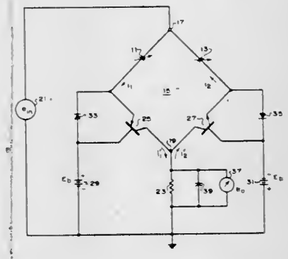
Methods of and systems for applying a voltage difference between at least two adjacent insulated conductors, testing for electrical characteristics of the insulated conductors as a result of the application of the voltage difference therebetween which are indicative of defective insulation and detecting for an electrostatic field adjacent to an end of a particular one of the conductors to determine if the one conductor is continuous.

3,577,071
MICROWAVE MATERIAL TESTER
Jack T. Collins, Boulder, Colo., assignor to Automation Industries, Inc., Century City, Calif.
Continuation of application Ser. No. 573,252, Aug. 18, 1966, now abandoned. This application Jan. 6, 1969, Ser. No. 789,203
Int. Cl. G01r *27/04*
U.S. Cl. 324—58.5 **2 Claims**



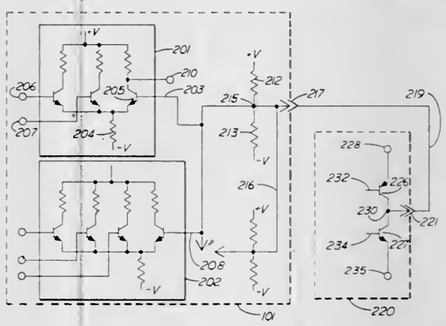
A nondestructive testing device is described wherein a workpiece is coupled to a microwave resonant cavity. In addition to the sampling cavity, a tuneable reference resonant cavity may be employed. A modulated tuneable klystron energizes both resonant cavities. A first phase-sensitive amplifier, responsive to the test cavity, controls a servosystem tuning the reference resonant cavity while a second phase-sensitive amplifier responsive to the reference resonant cavity tunes the klystron so that both cavities and the klystron are tuned alike after coupling of the workpiece. A digital readout is provided to indicate the tuning of the reference cavity. Alternatively, a single resonant cavity is coupled to a swept frequency klystron, with a filamentary workpiece passed through the cavity. The resultant Q of the cavity, and changes in resonant frequency thereof are indicated by an oscilloscope display.

3,577,072
BRIDGE CIRCUIT FOR DIFFERENTIALLY MEASURING CAPACITANCE
Arthur Miller, Chestnut Hill, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Nov. 19, 1968, Ser. No. 777,033
Int. Cl. G01r *27/26, 27/00*
U.S. Cl. 324—60C **6 Claims**



An AC bridge includes two variable capacitors and two complementary conductivity transistors. The two transistors conduct during opposite one-half cycles of the AC bridge excitation voltage to alternately couple the two capacitors in circuit with a load resistor. When either one of the capacitors is not coupled to the load, it is clamped to a source of reference potential by a diode. The output across the load is proportional to the difference in value between the two capacitors.

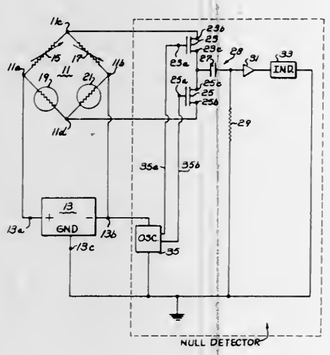
3,577,073
APPARATUS FOR AUTOMATED COMPUTER MAINTENANCE COMPRISING MEANS FOR VARYING THE INPUT SIGNAL SWITCHING THRESHOLD VOLTAGE FOR ANY OF A PLURALITY OF ELECTRONIC CIRCUITS
Seymour R. Cray, Chippewa Falls, Wis., assignor to Control Data Corporation, Minneapolis, Minn.
Filed Feb. 18, 1969, Ser. No. 800,105
Int. Cl. G01r *15/12*
U.S. Cl. 324—73 **7 Claims**



An apparatus for providing the automated maintenance checkout of large-scale computers by selectively stressing the

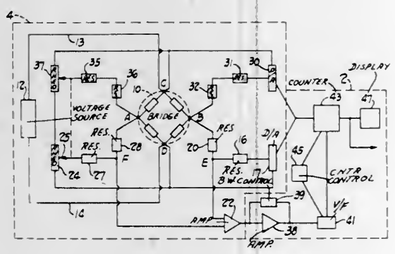
operating voltage margins of any of the plurality of electronic logic modules comprising the computer is disclosed. The selective stressing is accomplished under the control of an auxiliary data processing system.

3,577,074
BRIDGE MEASURING CIRCUIT
Julius Praglin, Beachwood, Ohio, assignor to Keithley Instruments, Inc., Solon, Ohio
Filed Oct. 15, 1968, Ser. No. 767,745
Int. Cl. G01r *17/02, 27/02*
U.S. Cl. 324—98 **2 Claims**



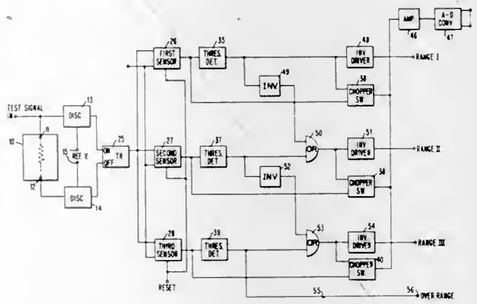
A measuring circuit is disclosed having a bridge with the input terminals connected to the positive and negative output terminals of a regulated power supply. The difference in potential between the output terminals of the bridge is adapted to be sensed by a null detector having a ground reference terminal provided by the power supply. In the null detector an indicator is connected to the bridge output terminals through an RC coupling network and MOS field-effect devices which are alternately rendered conductive by an oscillator. The polarizing voltage provided by the power supply for the bridge has a common ground with the null detector.

3,577,075
DIGITAL SERVO INDICATOR
Algirdas J. Krygeris, Richmond Heights, Ohio, assignor to Gilmore Industries, Inc., Cleveland, Ohio
Filed Nov. 14, 1968, Ser. No. 775,664
Int. Cl. G01r *17/06, 1/02*
U.S. Cl. 324—99 **4 Claims**



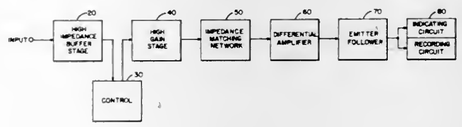
An automatic, null-balance potentiometric device having a digital readout in which the rate of balance is proportional to the magnitude of the error and balance is approached asymptotically on an exponential curve, such device providing improved damping characteristics and noise reduction whereby accurate resolution to a hundredth of a microvolt is obtained.

3,577,076
AUTOMATIC RANGE SCALE SELECTION APPARATUS FOR A MEASURING DEVICE
James E. Frushour, Endwell; Earnest H. Millham, Apalachin, and James E. Ortloff, Harpursville, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 5, 1968, Ser. No. 757,715
Int. Cl. G01r *15/08;* **G04f** *9/00*
U.S. Cl. 324—115 **5 Claims**



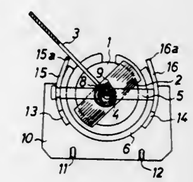
Apparatus for automatically selecting the proper scale in a measuring instrument wherein a transducer or sensor is provided for each required scale and all respond concurrently by producing an electrical analog output signal at various rates proportional to the input condition or property. A selection circuit compares the output levels with sensor limits and thereafter connects the output signal of the highest nonsaturated sensor with an analog-to-digital converter or indicating means.

3,577,077
APPARATUS FOR MEASURING THE AMOUNT OF MODULATION RESPONSE TO A DIFFERENTIAL INPUT SIGNAL
Sylvan A. Walliser, and Claire F. Asquith, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army
Filed Dec. 13, 1968, Ser. No. 783,645
Int. Cl. G01r *7/00*
U.S. Cl. 324—140 **7 Claims**



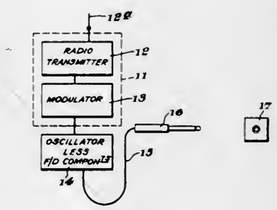
A modulation meter for comparing the amount of flow in one output port of a gas amplifier with the flow in another output port of the amplifier. An input signal is fed from the output ports by way of a differential pressure transducer to the meter where a high impedance buffer stage responds to the signal to activate a high gain stage. The input signal response is coupled through the gain stage and an impedance matching or buffer stage to a differential amplifier. The differential amplifier responds to signal changes by varying the current controlled to a load meter that indicates the gas flow. All stages are transistorized and the differential amplifier has an emitter follower output circuit that prevents loading of the differential amplifier by the meter.

3,577,078
ELECTRICAL MEASURING OR INDICATING INSTRUMENT
Willy Kisselmann, Grunwald; Fritz Rumpelein, Munich; Paul Kopf, Unterhaching, and Franz Landbrecht, Unterhaching, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Apr. 1, 1969, Ser. No. 811,739
Claims priority, application Germany, Apr. 3, 1968, P 17 66 101.7
Int. Cl. G01r *1/00*
U.S. Cl. 324—154 **9 Claims**



A moving-coil instrument wherein the end positions of the pointer which shares oscillatory movements of the coil are determined by two elastic paper strips. The strips have inner portions which are received in slots provided therefor in a support which constitutes or includes the instrument housing, and outer portions having transversely extending edges which abut against the pointer when the latter assumes the corresponding end position. The strips are adjustable with reference to the support to facilitate calibration of the instrument and are thereupon bonded to the support.

3,577,079
WATCHMAN'S RADIO LOCATION INDICATING SYSTEM
Kenneth John Horstmann, 14 Park Lane, Bath, Somerset, and Colin Grahame Douglas, "Stoneybroke" Watergate, Colerne, Wiltshire, England
Filed May 31, 1968, Ser. No. 733,675
Claims priority, application England, May 31, 1967, 25198/67
Int. Cl. H04b *1/02*
U.S. Cl. 325—53 **4 Claims**

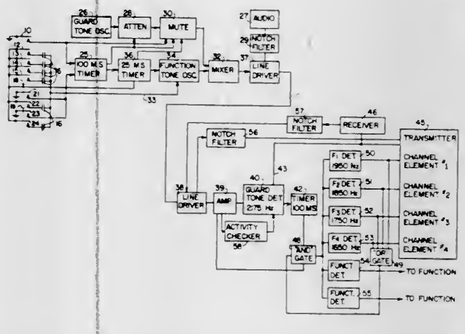


In a location system a radio transmitter carried by a security guard or watchman has a modulator and an oscillator, but without the frequency determining components. At various points which the guard is required to visit are sets of frequency determining components carried in wall boxes, each set of components providing a different modulating frequency. The guard plugs in a lead from the transmitter at each point and the modulated carrier from the transmitter is received at a remote location, demodulated, and the point at which the modulating frequency was generated is identified.

ERRATUM

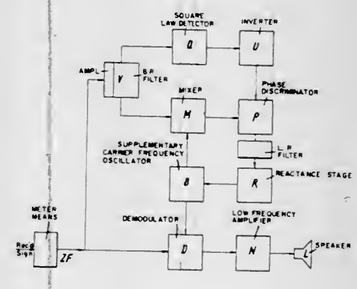
For Class 325—73 see:
Patent No. 3,577,073

3,577,080
REMOTE CONTROL SYSTEM FOR OPERATION OVER SAME AUDIOCHANNEL PROVIDING VOICE SIGNALS BETWEEN REMOTE STATION AND BASE STATION
Gary A. Cannalte, Hoffman Estates, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Dec. 20, 1968, Ser. No. 785,526
Int. Cl. H04b *1/60*
U.S. Cl. 325—183 **20 Claims**



Remote control system for controlling radio at base station from remote point over single audio channel which provides voice signals between remote and base stations, and which does not require DC continuity and operates within a fixed maximum frequency. A short burst of high amplitude guard tone is applied over the channel from the remote station to the base station to actuate a control at the base station which renders the controls thereat operative and blocks transmission of audiosignals from the base station to the channel. The remote station then applies lower amplitude tones to the audiochannel to actuate controls at the base station, with guard tone being applied continuously at low level during application of audio signals from the remote station to the base station. The base station responds to termination of tone signals (or to disconnect tones) to provide disconnect action, reset the controls and permit the base station to apply signals to the audio channel.

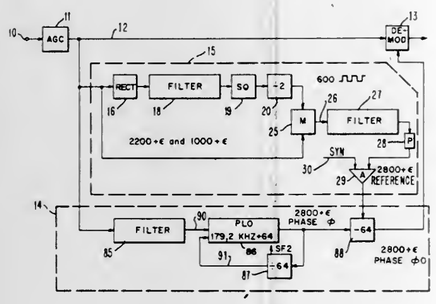
3,577,081
METHOD AND ARRANGEMENT FOR SYNCHRONIZATION OF THE SUPPLEMENTARY CARRIER FREQUENCY OSCILLATOR
Hansrichard Schulz, Villingen, Black Forest, Germany, assignor to Saba Schwarzwalder Apparate-Bau-Anstalt August Schwer Sohne GmbH, Villingen, Schwarzwald, Germany
Filed June 26, 1968, Ser. No. 740,238
Int. Cl. H04b *1/68*
U.S. Cl. 325—329 **6 Claims**



A suppressed carrier single sideband signal is received, converted to an intermediate frequency, and fed to a preferably square law detector for generating a reference

signal derived from the difference in frequency between a harmonic and the fundamental of the modulation frequency, or between two harmonics of the modulation frequency. The intermediate frequency signal is also fed to a mixer where it is combined with the supplementary carrier frequency oscillator signal thus generating a low frequency signal whose exact frequency depends both on the modulation signal frequency and any difference in frequency between the transmitter carrier frequency and the receiver supplementary carrier frequency. The reference signal and low frequency signal are compared in a phase discriminator yielding an error signal which is applied to a reactance stage which in turn serves to change the frequency of the supplementary carrier frequency oscillator in the receiver.

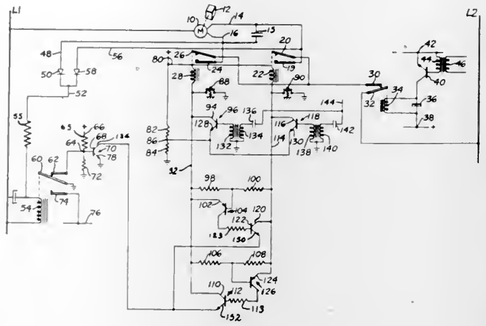
3,577,082
CARRIER FREQUENCY PHASE-READJUSTMENT DEVICE
Alex Honore Lautier, Vence; Henri Jean Nussbaumer, La Gaude, and Jean Marc Pierret, Falicon Nice, France, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 5, 1969, Ser. No. 804,570
Int. Cl. H04b *1/16*
U.S. Cl. 325—416 **6 Claims**



A phase synchronizing device for the carrier of a single sideband transmission system. Two pilot frequencies are transmitted with the synchronization signal and are decoded at the receiver to provide a signal indicating the correct phase of the demodulating carrier signal. The transmitted carrier signal controls the frequency of an oscillator and the initial phase of the regenerated carrier signal is set a the start of reception by the decoded pilot signals.

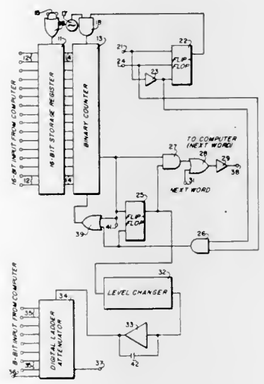
3,577,083
MODIFIED LATCH CIRCUIT SPECIFICALLY FOR SEARCH TUNING ARRANGEMENT
James S. Adams, Batesville, Ind., assignor to The Magnavox Company, Ft. Wayne, Ind.
Filed Aug. 5, 1968, Ser. No. 750,079
Int. Cl. H04b *1/32*
U.S. Cl. 325—471 **10 Claims**

A latch circuit is provided for a reversible motor, particularly for a search tuning motor on a television set, in which a relay is provided for each direction of rotation of the reversible motor and which relays can be energized manually or by remote control, and a holding circuit is provided for each relay comprising the collector-emitter circuit of a pair of serially arranged transistors, the second transistor in each pair of serially arranged transistors being the same transistor and being normally nonconductive and becoming conductive upon energization of the motor to run in either direction. The energization circuit to the motor is deenergized when



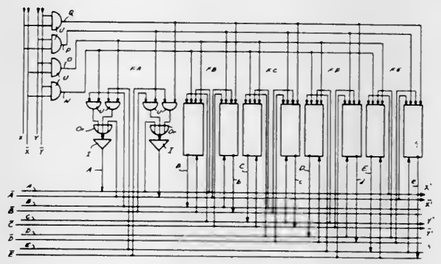
the motor reaches a predetermined position and this also interrupts the holding circuit which is at that time effective.

3,577,084
COMPUTER SOUND GENERATOR
Samuel M. Atcherson, Bowie, and Robert P. Rodgers, Silver Spring, Md., assignors to Singer-General Precision, Inc., Binghamton, N.Y.
Filed Nov. 3, 1969, Ser. No. 873,193
Int. Cl. H03k *23/00*
U.S. Cl. 328—14 **10 Claims**



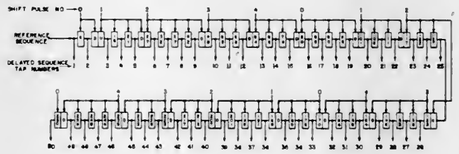
The generation of desired sounds and sound waveforms is useful in many fields. For this reason there have been many sound generators devised over the years. The system of this invention utilizes an automatic programming device to control the generation of a large variety of different sounds and sound waveforms. The apparatus comprises a flip-flop or similar device having a plurality of stable conditions. The flip-flop is alternately placed in each of its stable operative states under the control of an automatic programming device. The duration of a complete flip-flop cycle is determinative of the frequency of the generated waveform. The flip-flop output which may be processed through wave-shaping circuitry is subsequently amplitude controlled by a digital ladder attenuator. One automatic programming device which has been useful in this system is a general-purpose digital computer. The system described herein is an improvement over the systems described in the copending patent applications Ser. No. 707,615, SOUND GENERATOR, filed in the names of William E. Beavers, Jr. and William H. Sturdevant, and Ser. No. 710,237, COMPUTER SOUND GENERATOR, filed in the names of Robert A. Atchison, Robert E. Lutolf, and Edward F. Magee.

3,577,085
QUINARY REDUCTION STAGE AND FORWARD-REVERSE COUNTER
Theo Stutz, Geerlisbergstrasse, 8303 Bassersdorf, Switzerland
Continuation-in-part of application Ser. No. 679,966, Aug. 24, 1964, now abandoned, Continuation-in-part of application Ser. No. 538,663, Aug. 24, 1964, now abandoned, Continuation-in-part of application Ser. No. 392,998, Aug. 24, 1964, now abandoned, Continuation-in-part of application Ser. No. 279,039, May 6, 1963, now abandoned. This application Jan. 9, 1969, Ser. No. 856,225
Int. Cl. H03k *21/00*
Claims priority, applications Switzerland, May 4, 1962, Aug. 23, 1963, Apr. 7, 1965, Aug. 3, 1966, 5370/62, 10417/63, 4849/65 and 12559/66
U.S. Cl. 328—42 **14 Claims**



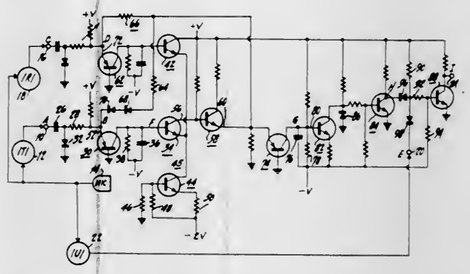
Two forms of a quinary reduction stage, for reducing the frequency of an input multiphase binary signal by a factor of five are illustrated. One corresponds to the use of a substantially minimum number of elements, while the other corresponds to use of identical binary circuits, all having the same number of inputs. By counting quarter periods of the input signal and half periods of the output signal, a decade reduction stage results. Further, each quinary reduction stage may be connected with a binary reduction stage thus furnishing a decade reduction stage, which may interconnect with other similar ones to constitute a decade forward-reverse counter.

3,577,086
GENERATOR OF DELAYED SEQUENCES EMPLOYING SHIFT REGISTER TECHNIQUES
Ivan M. Kliman, Glen Head, and Harold Smola, Carle Place, N.Y.
Filed Sept. 30, 1968, Ser. No. 763,677
Int. Cl. H03k *5/00*
U.S. Cl. 328—62 **4 Claims**



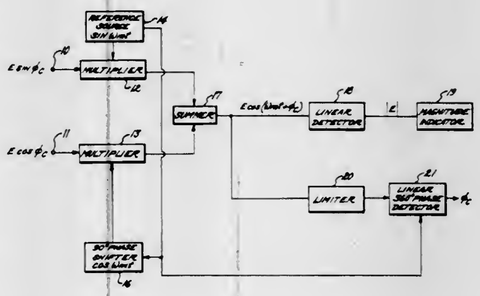
The circuitry involves a plurality of groups of shift register stages connected in cascade with temporary storage stages connected between each group of stages. A reference sequence is applied serially to the generator input and a number of substantially equally delayed replicas thereof are obtained from taps spaced along the generator, the number of the taps being different from the number of bits of the input reference sequence. In order to accomplish this, several different shift pulse trains must be applied to different of the groups of stages, the different shift pulse trains having different time delays or phases.

3,577,087
SEQUENCE "AND" GATE WITH RESETTING MEANS
Thomas B. Martin, Delran, and Henry J. Zadell, Haddonfield, N.J., assignors to Radio Corporation of America
Filed Sept. 27, 1968, Ser. No. 763,196
Int. Cl. H03k *5/20*
U.S. Cl. 328—110 **6 Claims**



Circuit for sensing two signals and producing an output when the signals are in sequence, with resetting means to inhibit the output after a specific time interval has elapsed between the two signals or whenever an intervening other signal occurs.

3,577,088
SINE-COSINE TO MAGNITUDE-PHASE ANGLE CONVERTER
William B. Goggins, Jr., Winchester, Mass., assignor to the United States of America as represented by the Secretary of the Air Force
Filed Feb. 3, 1969, Ser. No. 795,796
Int. Cl. H03d *3/06*
U.S. Cl. 328—134 **4 Claims**

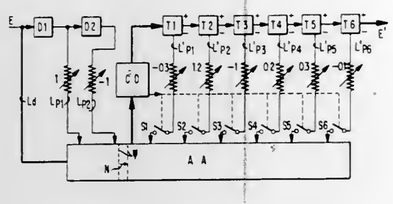


An analogue device for converting two voltages (AC or DC) each proportional to quadrature components E sin Φ and E cos Φ to two voltages, one proportional to E and one proportional to the phase angle Φ.

3,577,089
DATA TRANSMISSION TIME DOMAIN EQUALIZER
Etienne Gorog, White Plains, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 14, 1966, Ser. No. 520,798
Claims priority, application France, Feb. 26, 1965, 7545
Int. Cl. H03k *5/00*
U.S. Cl. 328—165 **3 Claims**

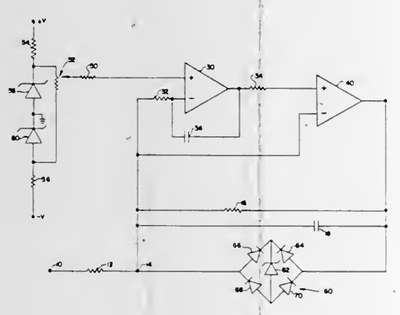
Apparatus for equalizing digital data which has been distorted in transmission. The value of the signal at each instant of time is delayed and modified by a weighting junction and added to the value of the signal input at the next instant of time in an analog adder. The output of the analog adder is applied to a series of cascaded digital correction devices, the

outputs of which are each connected through weighting junctions and switches to the analog adder to control the



equalization of the signal input. The equalized signal output is taken from the last of these cascaded correction devices.

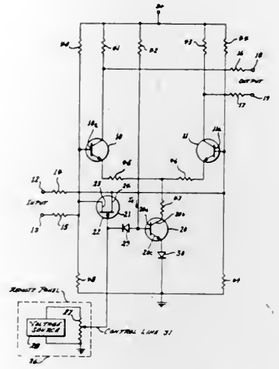
3,577,090
FAST SETTLING, STABLE AMPLIFIER CIRCUIT
William C. Montgomery, Jr., Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
Filed Aug. 25, 1969, Ser. No. 852,840
Int. Cl. H03f *1/00*
U.S. Cl. 330—69 **5 Claims**



Two operational amplifiers are connected in series. The first operational amplifier has a very stable drift characteristic and a feedback capacitor such that it has a very low frequency breakpoint. The second operational amplifier has a very fast response characteristic but may have a poor drift characteristic. A feedback impedance connects the output of a second operational amplifier to the input of the first operational amplifier and the input to the entire circuit is through an input impedance to the inverting input of both the first and second operational amplifiers.

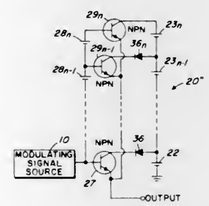
3,577,091
REMOTE CONTROLLED MONITOR CIRCUIT
Francis Rachal, Baltimore, and Donald B. McKone, Glen Burnie, Md., assignors to the United States of America as represented by the Secretary of the Air Force
Filed May 26, 1969, Ser. No. 827,553
Int. Cl. H03f *3/16, 3/8*
U.S. Cl. 330—24 **2 Claims**

An electronically operated remotely controlled circuit. The circuit provides desired logarithmic volume control from



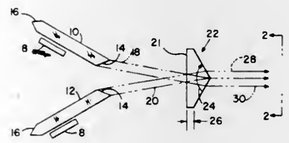
a single linear potentiometer, on-off gating, low noise and distortion, all from a differential-type integrated circuit.

3,577,092
SIGNAL PATH SERIES STEP-BIASED MULTIDEVICE HIGH-EFFICIENCY AMPLIFIER
Arthur P. Kubicz, Richardson, Tex., assignor to Collins Radio Company, Cedar Rapids, Iowa
Filed July 9, 1968, Ser. No. 743,525
Int. Cl. H03f *3/20, 3/68*
U.S. Cl. 330—124 **7 Claims**



A high-efficiency transformerless amplitude modulation system with an audio frequency power amplifier having at least two amplifier segments with at least one amplifier device in each, a different level voltage power supply for each amplifier segment, and a bias step between adjacent amplifier segments, and with a modulation output direct DC connection from the AFPA to the RF power amplifier of the system.

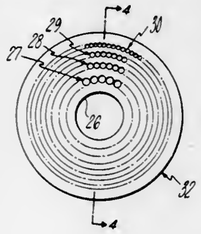
3,577,093
MEANS FOR OBTAINING MULTIPLE COHERENT-LASER APERTURES
George R. Simpson, Webster, N.Y., assignor to the United States of America as represented by the Secretary of the Army
Filed Sept. 13, 1968, Ser. No. 759,594
Int. Cl. H01s *3/05*
U.S. Cl. 331—94.5 **6 Claims**



Multiple coherent-laser apertures produced by directing

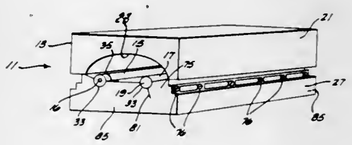
laser beams through a prism for optical interaction and coherence.

3,577,094
FRESNEL ZONE LASER COUPLING MIRROR
Richard G. Tomlinson, Glastonbury; Clyde O. Brown, Newington, and Alan F. Haught, Glastonbury, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Sept. 27, 1968, Ser. No. 763,222
Int. Cl. H01s *3/08;* **G02b** *5/18*
U.S. Cl. 331—94.5 **1 Claim**



A laser cavity includes a spherical mirror and a flat mirror, the flat mirror having a plurality of holes arranged in a Fresnel zone pattern so as to provide distributed output coupling having a near-field focal point; alternatively, the flat mirror may comprise a pattern of reflecting material on a light-transmissive medium.

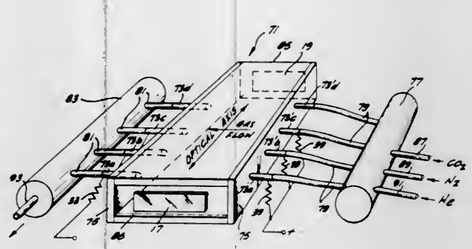
3,577,095
SEMIELLIPTICAL PUMP CAVITY
Richard C. Benner, Palos Verdes Estates, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Dec. 28, 1966, Ser. No. 606,521
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **5 Claims**



Cavity structure having a first section with a highly specularly reflective semielliptical inner surface and a second section of relatively high thermal conducting material enclosing the semielliptical inner surface along its longitudinal dimension. The second section has a relatively flat inner surface in which two longitudinal grooves are disposed, one for carrying a laser rod and the other carrying an elongated pump lamp. The second section also has a rod-clamping portion as part of the sidewall of the laser-rod-holding groove, the clamping portion extending above the second section's flat inner surface for holding the laser rod in both mechanical and thermally conducting contact with the second section.

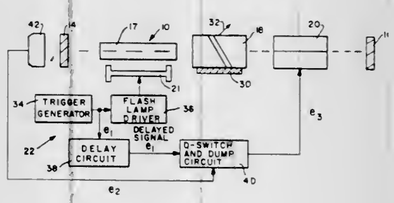
3,577,096
TRANSVERSE DISCHARGE GAS LASER
William B. Bridges, Thousand Oaks, and Peter O. Clark, Malibu, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Nov. 1, 1967, Ser. No. 679,704
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **12 Claims**

This invention relates to a gas laser wherein laser energy regeneratively propagates along regenerative paths through a gaseous laser medium and between spaced reflectors. The laser medium is pumped to an excited state to generate laser energy along said regenerative paths by causing an electrical discharge to be maintained through the laser medium across



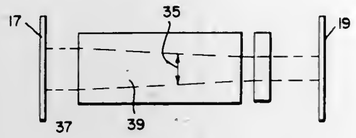
or transverse to the regenerative paths. In one embodiment, the gaseous laser medium is caused to flow through the laser cavity transverse to the laser optical path; and in another embodiment, a multiply folded path laser cavity is utilized.

3,577,097
LASER WITH COMBINED Q-SWITCH AND SYNCHRONIZED CAVITY DUMP CIRCUIT
Ronald P. Hilberg, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Nov. 28, 1967, Ser. No. 686,076
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **3 Claims**



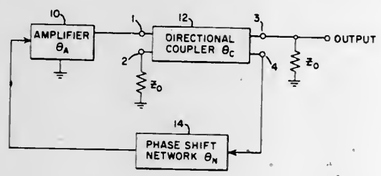
A laser employing a single modulator in the form of a Pockels cell in the laser cavity and a polarizer. The polarizer in the cavity passes radiation having one polarization direction coming from one direction and diverts radiation having another polarization direction into an absorber. The polarizer passes radiation having one polarization direction coming from an opposite direction and diverts radiation having the other polarization direction into an output path. The modulator in the cavity rotates the polarization direction of radiation to establish the other polarization direction when energized and permits passage of radiation when it is deenergized. A high voltage electrical waveform generator circuit is provided which generates a voltage waveform having a positive DC voltage leading edge and a negative DC voltage trailing edge to the modulator. A gas trigger tube is provided in the circuit which generates a positive DC voltage leading edge in its plate circuit when it is independently triggered by a trigger signal. Another gas trigger tube generates a positive voltage when it is triggered by another trigger signal from a photodiode positioned to intercept radiation leaking from laser cavity. A coupling circuit which couples the plate circuits of the trigger tubes includes a capacitor which converts the positive voltage generated by the other trigger tube into the negative DC voltage trailing edge of the voltage waveform. The coupling circuit may also include a differentiator which allows the voltage levels on the trigger tube plates to be independently varied without affecting each other.

3,577,098
THERMALLY COMPENSATED LASER
Harvey V. Winston, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed July 1, 1968, Ser. No. 741,682
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **5 Claims**



The invention is a laser in which an undesired thermal lensing effect of the active laser material is compensated by an addition of a material having a thermal lensing characteristic opposite that characteristic of the laser material. The active laser element and the compensating element are disposed within a regenerative cavity in a regenerative path defined between two end reflectors. As the active laser element is excited by pump energy, a thermal gradient in the laser material results from the excitation and a similar thermal gradient also results in the compensating material to negate the aforementioned thermal lensing effect.

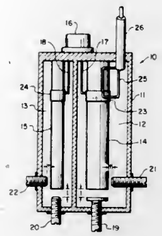
3,577,099
MICROWAVE OSCILLATOR HAVING DIRECTIONAL COUPLER IN FEEDBACK PATH
James A. Hall, and Harry J. Peppiatt, Lynchburg, Va., assignors to General Electric Company
Filed Feb. 27, 1969, Ser. No. 802,771
Int. Cl. H03b *5/12, 5/18*
U.S. Cl. 331—96 **7 Claims**



A microwave oscillator is provided with a solid-state amplifier device whose output is coupled to the input by a directional coupler. The oscillator characteristics can be reliably calculated, and the oscillator signals have a relatively small amount of noise.

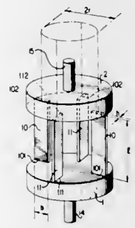
3,577,100
METEOROLOGICAL DEVICE EMPLOYING A TEMPERATURE COMPENSATED TRANSMITTER
Robert E. Askew, Berkeley Heights, and Henry C. Johnson, Neshanic, N.J., assignors to the United States of America as represented by the Secretary of the Army
Filed Feb. 28, 1969, Ser. No. 803,156
Int. Cl. H04b *1/02*
U.S. Cl. 331—117 **9 Claims**

This invention relates to a meteorological device that is used to transmit atmospheric conditions such as temperature, pressure, humidity, or the like, to a remote station. The transmitter of such device utilizes temperature-compensating means with a high-frequency transistor oscillator thereby obtaining a highly stable output over a wide temperature range. Temperature compensation is provided by mounting the transistor directly onto dual resonant coaxial cavities with one cavity connected to the transistor emitter and the other cavity connected to the base lead. The cavities are constructed of dissimilar metals thereby providing temperature dependent capacitance. The cavities are provided with sets of adjusting screws to provide for adjustments in cavity



resonance brought about by both lateral and transverse unequal expansion in the cavities.

3,577,101
ELECTROMECHANICAL TORSIONAL OSCILLATOR
Lotar Pege, Bad Schwalbach, Zur Hardt, Germany, assignor to Forschungslaboratorium, Prof. Dr. Ing. W. Heimann
Filed Oct. 16, 1968, Ser. No. 769,473
Claims priority, application Germany, Oct. 20, 1967, P 15 89 795.7
Int. Cl. G02f *1/34;* **H03b** *5/30*
U.S. Cl. 331—154 **9 Claims**

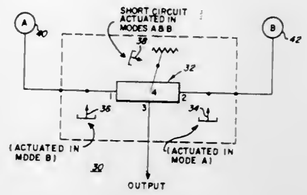


An electromechanical torsional oscillator for the modulation of devices for measuring electromagnetic radiation frequencies, the oscillator including a mechanical vibrator device with two opposing cylindrical plugs linked to one another by a plurality of double-cantilever-type leaf springs attached by their ends alternately to one or the other plug, so as to give the plugs only a single (rotational) degree of freedom relative to one another. The device further includes electromagnetic driving means to maintain an oscillating motion which, in an exemplary application, is used to vibrate the shading shutter of a radiation-modulating-type temperature-measuring apparatus. Means are provided to adjust the resonant frequency.

3,577,102
SUM OR SELECT NETWORK HAVING SHORT CIRCUITING MEANS CONNECTABLE TO HYBRID TEE CIRCUIT
Joseph Gindsberg, Brookline, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Dec. 30, 1968, Ser. No. 787,914
Int. Cl. H01p *1/10*
U.S. Cl. 333—7 **7 Claims**

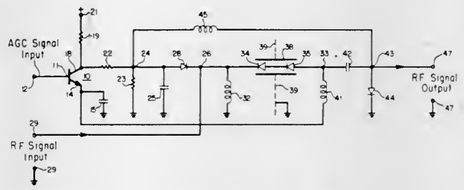
This invention relates to a sum-or-select network for connecting two coherent sources of electrical power to a useful

load such that the total available power from both sources, or either source alone, can be applied to the load with minimum



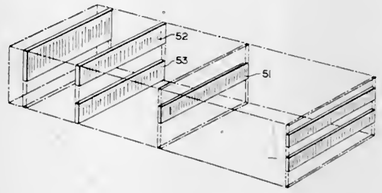
loss. The network uses a single hybrid tee which can be connected to suitably placed short-circuit terminations if the power from either source fails.

3,577,103
VARIABLE ATTENUATOR FOR A WAVE SIGNAL RECEIVER
David E. Sparks, Chicago, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.
Filed Apr. 1, 1969, Ser. No. 811,893
Int. Cl. H04b *3/04;* **H01p** *1/22*
U.S. Cl. 333—17 **9 Claims**



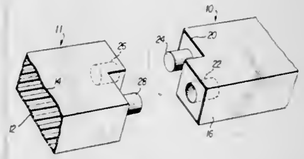
Attenuation of a received carrier, such as a television signal, may be made dependent on the carrier's signal strength by means of a pi network of variable-resistance diodes, the bias currents of which are controlled by an automatic gain control signal. The diodes in the two shunt arms of the pi network are supplied with forward bias currents that vary directly with received signal strength variations, whereas each diode in the network's series arm receives forward bias current that changes inversely with signal strength variations. In this way, the series arm resistance varies directly, while the resistances of the shunt arms vary inversely, with changes in the carrier's signal strength.

3,577,104
WAVEGUIDE FILTER HAVING SEQUENCE OF THICK CAPACITIVE IRISES
Ralph Levy, Newton, Mass., assignor to Microwave Development Laboratories, Inc., Needham Heights, Mass.
Filed Dec. 26, 1968, Ser. No. 786,967
Int. Cl. H03h *7/10*
U.S. Cl. 333—73 **1 Claim**



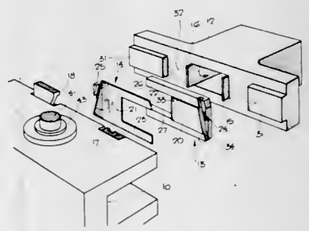
A compact microwave band-pass filter utilizes a sequence of thick capacitive irises stationed along the interior of a waveguide to form a series of directly coupled resonant chambers. The spacing between consecutive irises is $\lambda_u/4$ or less, where λ_u is the upper cutoff frequency of the filter. The close iris spacing causes the second harmonic pass band for the fundamental mode to be far above the main pass band.

3,577,105
METHOD AND APPARATUS FOR JOINING PLATED DIELECTRIC-FORM WAVEGUIDE COMPONENTS
Howard S. Jones, Jr., Washington, D.C., assignor to the United States of America as represented by the Secretary of the Army
Filed May 29, 1969, Ser. No. 828,891
Int. Cl. H01p *1/04, 3/12;* **F16b** *7/00*
U.S. Cl. 333—95 **10 Claims**



A plated dielectric waveguide component which includes a dielectric foam substrate propagating medium and a thin metallic surface encapsulating the substrate for carrying a conducting current therealong and a method of interconnecting the same. The waveguide component has a quarter wavelength step-shaped end which may be readily butt joined with another plated dielectric waveguide component having a similar construction and matching end whereby a lightweight, sturdy and highly efficient connection is obtained.

3,577,106
ADJUSTABLE IRIS
Leslie Gaza Varhelyi, Ottawa, Ontario, Canada, assignor to Northern Electric Company Limited, Montreal, Quebec, Canada
Filed July 14, 1969, Ser. No. 841,693
Int. Cl. H01p *1/00, 5/04;* **F16k** *3/03*
U.S. Cl. 333—98 **5 Claims**

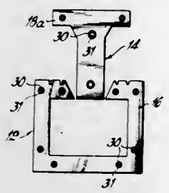


A variable aperture iris located at a waveguide T-junction. Two sliding gates and their related positioning members are of a suitable configuration to form a smooth continuous surface along the waveguide for all sizes of aperture opening.

3,577,107
AC OPERATED MAGNET
Gerhard Widl, Ditzingen; Kurt Groetzner, Stuttgart-rot, and Adolf Knodler, Fellbach, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Feb. 7, 1969, Ser. No. 797,583
Claims priority, application Germany, Feb. 28, 1968, P 16 39 210.2
Int. Cl. H01f *7/12*
U.S. Cl. 335—248 **7 Claims**

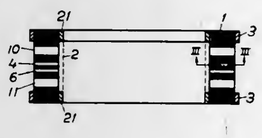
A magnet with laminated core and armature arranged for operation with AC current. A plastic casing surrounds the

laminated iron in the core and armature members and subdivides the lamination into two identical sections. The intermediate plastic layer which subdivides the lamination serves



as an impact surface between the armature and the core member of the magnet. The laminations are reinforced and held together through plastic filled notches, as well as stress takeup rods.

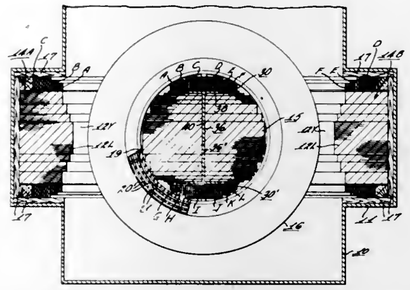
3,577,108
ANNULAR MAGNETOELASTIC TRANSDUCER
Waldemar Bengtson, and Orvar Dahle, Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Sept. 8, 1969, Ser. No. 855,922
Claims priority, application Sweden, Sept. 10, 1968, 12124/68
Int. Cl. H01f *21/02*
U.S. Cl. 336—20 **2 Claims**



An annular magnetoelastic transducer has a core in the shape of a cylindrical ring. The core is manufactured by winding a striplike magnetostrictive material so that the plane of the strip is parallel to the central axis of the ring. In the core is a number of holes which are arranged substantially radially through the core. The holes are arranged in groups which are evenly distributed around the circumference of the core. In the holes there is a winding connected to a current source for generating a magnetic flux in the core and a winding connected to a measuring device for indicating the alterations of the magnetic flux which appears when the core is subjected to mechanical forces.

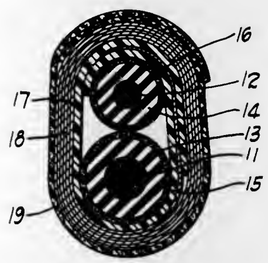
3,577,109
MAGNETIC SHIELDING CONSTRUCTION FOR ELECTRIC TRANSFORMERS
Samuel L. Foster, Eagle, Wis., and Reed H. Johnston, Wellesley, Mass., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Sept. 18, 1968, Ser. No. 760,430
Int. Cl. H01f *15/04*
U.S. Cl. 336—84 **13 Claims**

In an electric transformer, magnetic laminations for shielding the main magnetic core from leakage magnetic flux are positioned between the inner periphery of the coil and the portion of the main magnetic core which extends through the coil window. The shield laminations are arranged in closed magnetic loops, with the major surfaces of the shielding laminations lying in planes perpendicular to the major surfaces of the main core laminations, whereby only the edges of the shielding laminations are presented to the leakage



magnetic flux, thereby minimizing eddy current losses and consequent overheating of the laminations.

3,577,110
TRANSFORMER HAVING A WOUND CORE AROUND LINEAR CONDUCTORS
Robert L. Arntz, and John R. Marker, Jr., Mansfield, Ohio, assignors to Dominion Electric Corporation, Mansfield, Ohio
Filed May 9, 1969, Ser. No. 823,326
Int. Cl. H01f *17/06*
U.S. Cl. 336—175 **4 Claims**

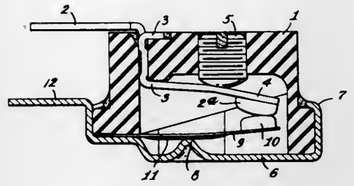


A transformer having a pair of insulated wires disposed generally adjacent and parallel to each other, one wire being the primary and the other wire being the secondary of the transformer, said insulated wires being wrapped by a film of insulating material. The wrapped wires have a ferrous foil, coated with an insulating film, wrapped in several layers tightly therearound. The assembly of wrapped wires with foil therearound is bound together by a binder. The inner margin of the foil is adhered to the outer margin of the film of insulating material to anchor it and the outer margin of the foil is adhered to the binder. The binder is turned inward at the axially spaced ends of the transformer to protect the foil at those ends. A method of making the transformer is disclosed, including the steps of disposing the insulated wires as stated, wrapping the insulation material therearound, wrapping the foil therearound, and binding the wrapped foil in place.

3,577,111
MINIATURIZED SNAP ACTING THERMOSTATIC SWITCH
Antonio Nardulli, Marigliano, Naples, Italy, assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Apr. 2, 1969, Ser. No. 812,699
Claims priority, application Italy, Apr. 3, 1968, 36032A/68
Int. Cl. H01h *37/54*
U.S. Cl. 337—89 **8 Claims**

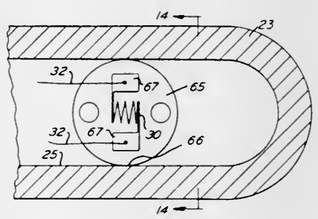
A miniature thermostatic switch in which a snap acting thermostatic element having a nondevelopable portion

responsible for its snap action is cantilever mounted in a metallic shell. A second mating shell is of electrically insulating material and clamped thereto is an adjustable stationary contact member. In one embodiment the operating temperature of the snap acting thermostatic element is controlled by



eliminating creep action prior to snapping of the element by means of a dimple in the metallic shell which applies a bias to the nondevelopable portion of the thermostatic element. In another embodiment the creep action is avoided by forming the entire thermostatic element in the nondevelopable shape.

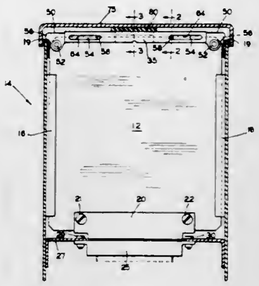
3,577,112
APPARATUS FOR HIGH PRESSURE MEASUREMENT
John C. Bowen, Huntingdon Valley, and Howard G. Fischer, II, Hatboro, Pa., assignors to The Duriron Company, Inc., Dayton, Ohio
Continuation-in-part of application Ser. No. 723,030, Apr. 22, 1968, now abandoned. This application May 22, 1969, Ser. No. 826,892
Int. Cl. G01l *1/22*
U.S. Cl. 338—4 **18 Claims**



Apparatus for high pressure measurement utilizing strain gages removably mounted in an opening in an object to which a force, such as fluid pressure, is applied. The mounting is separated from the location of application of the high pressure. The strain gages are carried on plates or the like or may comprise plates, for ready insertion and removal.

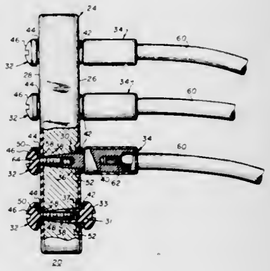
3,577,113
ELECTRONICS CARD EXTRACTOR
Robert Thomas Maitland, Franklin Lakes, N.J., assignor to The Bendix Corporation
Filed Oct. 2, 1969, Ser. No. 764,483
Int. Cl. H01r *13/62*; **H05k** *5/02*
U.S. Cl. 339—17 **4 Claims**

An electronics card extractor utilized in the insertion and extraction of circuit cards from a card holder or electronics box having guiding elements or card slides secured at opposite sides of the box and extractors pivotally mounted at opposite outer corners of the card, the extractor being operative by a handle to cause projecting end portions of both extractors to simultaneously bear upon opposite reinforced upper edge portions of the card holder which in effect become fulcrums about which the force applied to the handle may initially provide an extraction force to effect a full disengagement of a card connector at a lower edge of the card from a connector mounted on the lower surface of the box, and thereafter upon the operator continuing to raise the handle the extractors then function to withdraw the card from



the card holder, the extracting and card withdrawing forces being applied in sequence in one smooth upward motion.

3,577,114
CONNECTING DEVICE
William M. Hawkins, Scotch Plains, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Dec. 12, 1969, Ser. No. 884,564
Int. Cl. H01r *13/52*, **H01r** *7/06*
U.S. Cl. 339—94 **22 Claims**

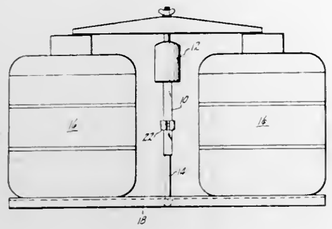


An insulated, sealable, connecting device for mechanically and electrically releasably coupling at least two conductors to provide a substantially watertight assembly, comprising, in combination, an insulated, electrically conductive body member having at least two apertures therethrough, at least two selectively bored, partially insulated, conductor-receiving stubs adapted to be releasably engaged therein, at least two threaded fastening means adapted to releasably couple an associated stub within the apertured conductive body member, and at least two first and at least two second resilient sealing means to provide sealing engagement between, respectively, the conductive body member and an associated stub, and the conductive body member and an associated fastening means.

3,577,115
ELECTRICAL CONNECTOR STORING DEVICE FOR MOTOR VEHICLE TRAILERS
Joseph W. E. Whitright, Cheshire, Conn., assignor to Cheshire Manufacturing Co., Inc., Cheshire, Conn.
Continuation-in-part of application Ser. No. 706,305, Feb. 19, 1968, now abandoned. This application Oct. 17, 1969, Ser. No. 867,342
Int. Cl. H01r *13/44, 13/52*; **A44b** *21/00*
U.S. Cl. 339—36 **2 Claims**

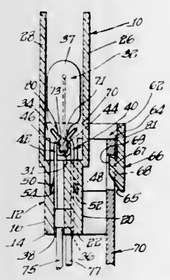
A device for storing and protecting an electrical plug on a trailer when disconnected from the motor vehicle by which

the trailer is drawn, in which an inverted hood is provided on a mounting channel that is attached to a fixed portion of the trailer. The hood is attached to the mounting channel by



simply inserting its wall into slots in the upper end of the channel, these slots being positioned so that the wall of the hood is gripped tightly between the flanges on one side and the web of the channel on the other.

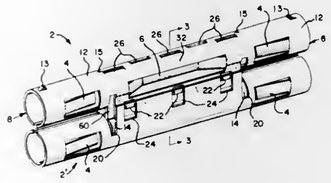
3,577,116
LAMP SOCKET AND TERMINAL
Bruno Baumanis, River Forest, Ill., assignor to Molex, Incorporated, Downers Grove, Ill.
Filed Aug. 8, 1968, Ser. No. 751,079
Int. Cl. H01r *13/60*
U.S. Cl. 339—125 **6 Claims**



A lamp socket for receiving an easily replaceable lamp bulb, comprising a plastic housing having a pair of opposing terminals extending therethrough for receiving the base of the lamp bulb therebetween to make both mechanical and electrical contact therewith, and mounting means integrally formed with a sidewall of the housing for snapping the lamp socket onto a mounting tab extending from a panel. A first embodiment of mounting means includes a resilient arm having a lock tab at the free end thereof for insertion into an aperture in the panel mounting tab, and a second embodiment includes a pair of opposing arms and a nib extending therebetween from one wall of the housing. The arms hold the panel tab against the housing wall and the nib is received in the aperture of the panel tab to retain the socket on the panel.

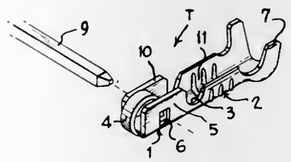
3,577,117
ELECTRICAL CONNECTOR
Harold Louis Bruetsch, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 24, 1969, Ser. No. 801,473
Int. Cl. H01r *13/12*
U.S. Cl. 339—248 **3 Claims**

This invention relates to a cylindrical wire splice having an internal metallic connector portion formed by rolling multiple precut metal strip, and an insulating cover rolled about the connector portion to insulate the electrical contact of the connector portion from points external of the device. The ends of the wires to be spliced have a radially enlarged collar which is engaged by oppositely directed tines of the connector portion to position the ends of the wire within the device. Cantilever surfaces at the center of the connector portion rigidly grip the ends of the wire to form a proper electrical contact therebetween. The ends of the insulating cover have



resilient plug members which are inserted therein to seal the wires both before and after insertion into the device. The plug members have an opening to allow the insertion of the wires therein, and a portion of the plug member extends across the opening to seal the interior of the connector portion prior to the insertion of wires in the device.

3,577,118
ELECTRICAL TERMINAL
Geroge Sylvester Reider, Highspire, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Continuation of application Ser. No. 669,551, Sept. 21, 1967.
This application Apr. 23, 1969, Ser. No. 869,405
Int. Cl. H01r *11/08*, **H01r** *11/22*
U.S. Cl. 339—258 **4 Claims**

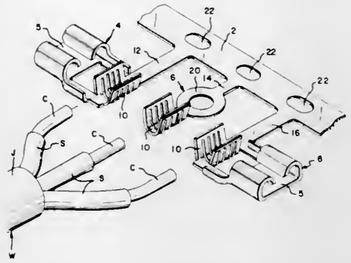


A detachable flag-type terminal which may be stacked on a post is disclosed. The terminal is generally U-shaped in cross section. The web is extended and arched rearwardly to form a spring means which acts as a post-holding means. Openings are formed in the sidewalls of the web. The openings are formed in the sidewalls of the web. The openings are aligned thereby creating a passage through which a post may be inserted in a direction normal to the axis of the ferrule of the terminal.

3,577,119
ELECTRICAL CONNECTORS ON A CARRIER STRIP
Armand Rene Delyon, Harrisburg, and Lex Donald Kensinger, Hershey, Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed June 4, 1969, Ser. No. 830,357
Int. Cl. H01r *11/08*
U.S. Cl. 339—276 **5 Claims**

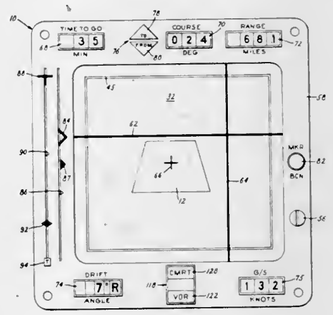
Plural different electrical connectors are provided on a common carrier strip so that each conductor of a multiconductor wire may have a specific connector secured or terminated thereto. The resulting terminated conductors are particularly useful in e.g., automobile wiring harnesses. The strip is adapted to be fed into automatic crimping presses

wherein one set of crimping dies is used to crimp all of the connectors on the strip. Connectors are severed from the



carrier strip when they are crimped onto the conductors of the multiconductor wires.

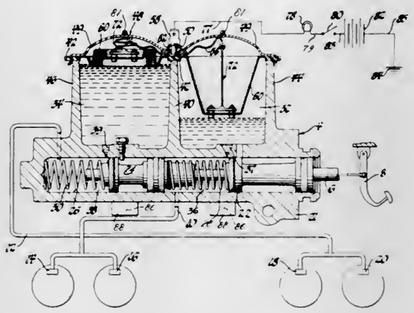
3,577,120
DISPLAY SYSTEM FOR USE IN VTOL-TYPE AIRCRAFT
Archie T. Sherbert, Jr., Media, Pa., assignor to The Boeing Company, Seattle, Wash.
Filed Oct. 14, 1968, Ser. No. 767,182
Int. Cl. B64d *45/04*
U.S. Cl. 340—27 **15 Claims**



A system for displaying information relating to the operation of a vehicle, such as an aircraft. An integrated approach/hover indicator provides a pictorial representation of an intended landing site for the aircraft and indicates the position of the aircraft relative to the landing site and relative to a preselected path leading to the landing site. The pictorial representation is displayed in proper perspective such that a pilot viewing the instrument would think he is actually viewing the landing site. In addition, the instrument provides digital readout and other devices which visually display a number of operating values relating to the performance of the aircraft.

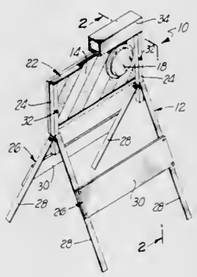
3,577,121
BRAKE FLUID LEVEL SWITCH
Douglas J. Wing, St. Clair Shores, and William A. Ramey, Warren, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 10, 1969, Ser. No. 875,080
Int. Cl. B60q *1/00*
U.S. Cl. 340—59 **6 Claims**

A vehicle brake master cylinder assembly of the dual reservoir type including a fluid level responsive diaphragm positioned in each of the reservoirs. Each diaphragm supports a flexible insulator member which in an acceptable fluid level position is placed between a resilient spring-biased contact member and an electrically grounded reservoir cover maintaining a signal circuit therebetween open. Should the level of fluid in a reservoir decrease to a predetermined minimum level, its resilient insulator is pulled from between one of the spring-biased contacts and the reservoir cover closing the circuit to the signalling device, thereby informing the operator of the low fluid condition. Removal of the reservoir cover



and filling of the reservoir raises the diaphragm to its uppermost position, but does not again open the signal circuit until the attendant performs the positive act of placing the insulator member between the spring-biased contact and the cover.

3,577,122
FLAT PANEL TRAFFIC WARNING SIGN HAVING LIGHT MOUNTED THEREON
James O. Lapham, 308 N. Westridge Ave., Covina, Calif.
Filed Jan. 9, 1969, Ser. No. 790,032
Int. Cl. G08b *5/36*, **G08b** *5/38*
U.S. Cl. 340—114 **2 Claims**

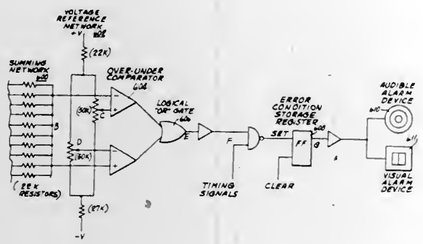


A traffic warning sign having a flasher mounted within an opening in a panel of the sign so as to be visible from either side of the panel and connected to a flasher circuit and battery by leads contained within a concealed passageway or groove in the panel. One disclosed embodiment of the invention is a street barricade in which the flasher circuit and battery are contained within a housing which also tends to shield the lenses of the flasher lamp. A second disclosed embodiment is a traffic lane divider.

3,577,123
METER READING SYSTEM
James R. Taylor, Allendale, N.J., and Thomas C. Clements, New York, N.Y., assignors to Neptune Meter Company, New York, N.Y.
Filed May 31, 1968, Ser. No. 733,372
Int. Cl. G01d *3/08*; **G11b** *27/36*; **H03k** *13/34*
U.S. Cl. 340—146.1 **9 Claims**

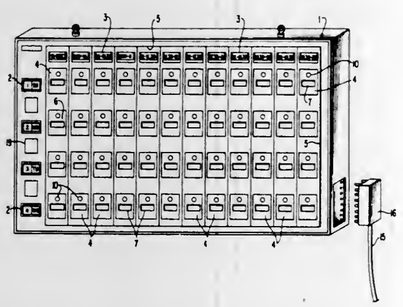
In a system for reading meter registers and the like, special error detecting circuits are provided in the meter reading and recording apparatus forming part of the system. For every character recorded two error checks are performed, one at the decimal level, and a further one at the binary level. The decimal check determines if there are any errors that have been introduced due to faults anywhere in the decimal por-

tion of the system, including the entire house installation. Such errors might arise, for example, due to open or short circuits within such installation. A fault at the decimal level will result in a "no digit/multidigit" or "house error" indica-



tion being given. The binary check determines if the recorder electronics are working properly. A fault at the binary level will result in an incorrect parity indication, or "recorder error" being given.

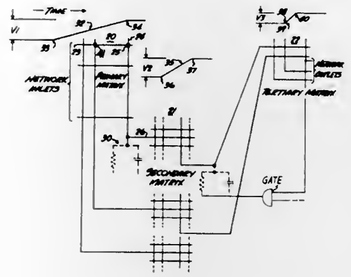
3,577,124
PRE-ENGAGEMENT CARD CONTROLLED PATIENTS
Tadataka Kobayashi, Kyoto Prefecture, Japan, assignor to Iwao Ueda, Kyoto, Japan
Filed July 24, 1969, Ser. No. 844,265
Claims priority, application Japan, July 25, 1968, 43/52808
Int. Cl. H04q *3/00*, **H04q** *5/00*
U.S. Cl. 340—153 **10 Claims**



Appointment selection device formed by a plurality of card holding compartments arranged in rows and columns. The rows designate days and the columns designating time periods within a day, the compartments including adjustable means for regulating the size thereof thereby permitting introduction of no more than a prescribed number of cards in a given compartment. Indicating means is provided for indicating when a compartment contains a prescribed number of cards.

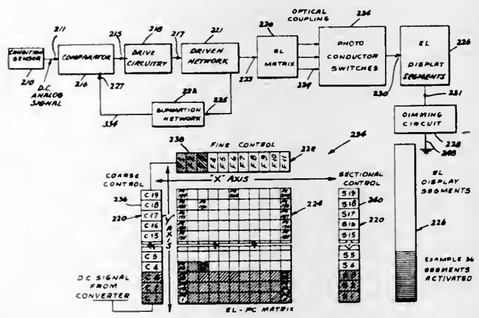
3,577,125
MONOLITHIC ELECTRONIC SWITCHING NETWORK HAVING VARIABLE VOLTAGE LEVELS
Jack G. Frisbie, Great Falls, Va., assignor to International Telephone & Telegraph Corporation, New York, N.Y.
Filed Oct. 16, 1968, Ser. No. 767,973
Int. Cl. H04q *1/00*
U.S. Cl. 340—166 **9 Claims**

The invention relates to a solid state switching matrix, a plurality of which may be cascaded to provide a switching network. Various means are disclosed for controlling the amount of energy required to fire a diode in one matrix and the amount of energy passing through the diode after it has fired. By the selection of proper characteristics, the diodes in each state may be made to fire on less energy than was required to fire the diodes in the next preceding state. This



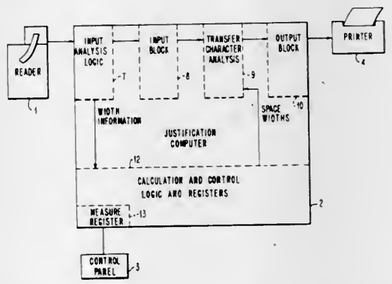
way, the diodes may be made to scan idle points in the network without causing offensive levels of fan-out current to build up.

3,577,126
PULSE RESPONSIVE CONTROL NETWORK
Robert J. Molnar, New York, N.Y., and Walter Parfomak, Wallington, N.J., assignors to The Bendix Corporation
Filed Sept. 11, 1968, Ser. No. 758,946
Division of Ser. No. 535,745, Mar. 21, 1966, Pat. No. 3,440,637.
Int. Cl. H04q *3/00*
U.S. Cl. 340—167 **31 Claims**



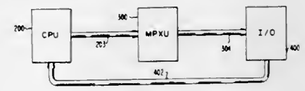
A pulse responsive control network including a first and second plurality of control devices sequentially operated by electrical signal pulses of one sense for effecting control functions, together with first and second means operable respectively in response to initial sequential operation of a last of said first and second plurality of control devices for providing clearing pulses of another sense to condition other of the respective first and second plurality of control devices for sequential reoperation to effect a multiplexing action, together with switching means effective upon completion of the reoperation of the other of said first plurality of control devices to condition the second plurality of control devices for sequential operation by the electrical signal pulses of said one sense; and other means to effect electrical signal pulses of said other sense to selectively terminate the operation of the first and second plurality of control devices, said last mentioned means including a time delay means to cause the signal pulses of said other sense to terminate the operation of said second plurality of control devices after termination of the operation of the first plurality of control devices has been effected.

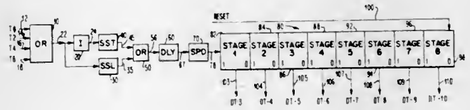
3,577,127
COMPOSER SYSTEM FOR PROCESSING DATA IN PARALLEL COLUMNS
David Bishop, Austin; David W. Terry, Georgetown, Tex.; John E. Jones, Raleigh, N.C.; Roderick S. Heard, and William H. Davis, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 26, 1968, Ser. No. 724,552
Int. Cl. G06f *15/06*; **G06f** *15/46*
U.S. Cl. 340—172.5 **35 Claims**



The invention concerns composing systems including techniques and apparatus for achieving justification of columnar data. In one version, Method A, the system derives columnar data from a source media, such as the familiar "-Presswire" paper tape having pairs of text columns arranged in successive justified lines, recognizes the occurrence of a code in the media identifying the center of the line between the two columns, if such occurs within a certain range, compares the line center code with a predetermined range about the center location of a previously entered line measure, and develops the necessary justification routines to insure that each of the double columns in successive lines is justified to a standard width thereby insuring that the gutter (or white space) between the column segments is of a uniform width and has straight edges. In a second version, Method B, data derived from the tape media is also scanned to determine the occurrence of the line center in successive lines, but the necessary justification routines for insuring a uniform placement of the gutter (or white space) is based upon a comparison of the center indicating code with a range about the center of the fixed width of both column segments in an individual line. The system readily accommodates a number of column segments greater than two in individual lines and column segments that differ in width. Also, it is receptive to input data derived from sources other than a paper tape media, and the output of the system, rather than being a printer, as described herein, can be any one of a number of composing entities, recording units, communicating units, or the like.

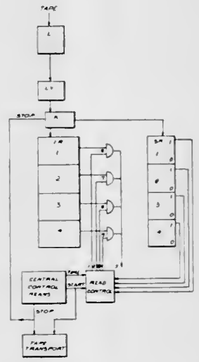
3,577,128
SYNCHRONIZING CLOCK SYSTEM
Tony N. Criscimagna, Woodstock, and Robert J. Fournier, Staatsburg, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 14, 1969, Ser. No. 790,952
Int. Cl. H03k *3/64*
U.S. Cl. 340—172.5 **3 Claims**





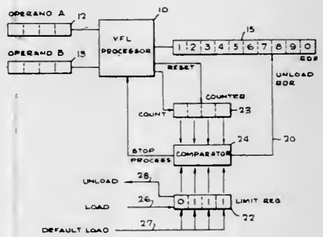
In a data processing system, apparatus for synchronizing a slave clock in an input/output device with a master clock in a central processing unit. A set of clock signals from a CPU are received in parallel, converted to serial and pulses are generated in response to the leading and trailing edge of each of the series of signals. The series of pulses is then delayed and shaped to drive a slaved I/O clock. A delay line is adjusted so that the total equivalent system delay is equal to an integral number of CPU pulse durations.

3,577,129
INFORMATION READ-OUT CONTROL SYSTEM
Klaus Jorg Hecker, Main-Taunus Kreis, Germany, assignor to Eichner Organisation GM/BH, Frankfurt Am Main, Germany
Filed Sept. 18, 1968, Ser. No. 760,616
Int. Cl. G11b *19/00*; **G11c** *19/00*
U.S. Cl. 340—172.5 **6 Claims**



A tape transport requires a predetermined time period for stopping after receipt of a stop signal. During this predetermined time period the information items from the tape are stored in a shift register. A second shift register with the same number of stages as the first shift register generates a signal from each stage corresponding to a stage in the first shift register wherein an information item was stored. When the tape transport is restarted the information from the first shift register is read out under control of timing signals and signals from the second shift register.

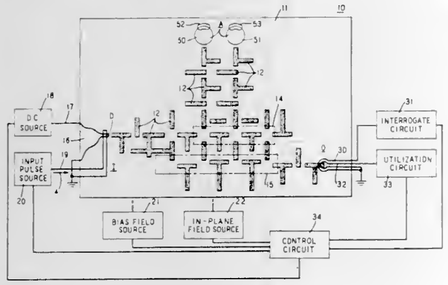
3,577,130
MEANS FOR LIMITING FIELD LENGTH OF COMPUTED DATA
Rex Rice, Menlo Park; Gilman D. Chesley, Los Altos, and William R. Smith, Mountain View, Calif., assignors to Fairchild Camera and Instrument Corporation, Mt. View, Calif.
Filed Oct. 3, 1969, Ser. No. 863,454
Int. Cl. G06f *7/00*
U.S. Cl. 340—172.5 **2 Claims**



Limit hardware for controlling the field length of resultant data produced by a data processor including a limit register, a counter and a comparator. The limit register is loaded with

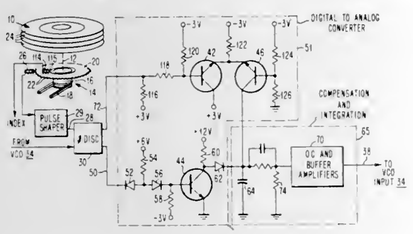
any desired number representing the desired number of fields of the resultant data, while the counter is incremented as each field of resultant data is produced by the processor. When the contents of the limit register and the counter are equal, data processing is terminated and the desired number of resultant data produced by the processor is supplied to any appropriate user, before a new processing operation is initiated.

3,577,131
DOMAIN PROPAGATION ARRANGEMENT
Robert H. Morrow, Lebanon Township, Hunterdon County, and Anthony J. Perneski, Martinsville, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Jan. 30, 1969, Ser. No. 795,148
Int. Cl. G11c *19/00*; **G11c** *11/14*
U.S. Cl. 340—174 **14 Claims**



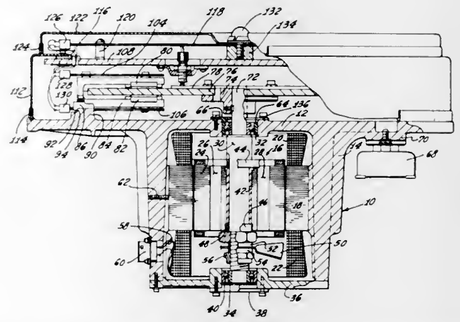
Interactions between single wall domains permit logic operations to be realized in magnetic sheets in which such domains are moved. Magnetically soft overlay patterns not only define propagation channels for such domains in response to magnetic fields reorienting in the plane of the sheet but also define channel intersections where logic functions are carried out. Domains are idled or, alternatively, in direction at those intersections depending on the positions of preceding domains. A variety of counter circuits are described.

3,577,132
PHASE LOCKED OSCILLATOR FOR STORAGE APPARATUS
Donald E. Anderson; Lawrence M. Koch; Robert E. Lloyd, and Frank J. Sordello, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 6, 1968, Ser. No. 735,137
Int. Cl. G11b *5/44*; **G11b** *19/28*; **G11b** *27/10*
U.S. Cl. 340—174.1A **9 Claims**



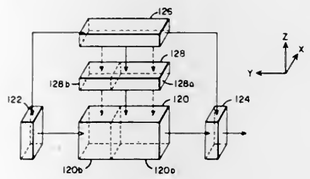
A phase-locked oscillator useful for a magnetic storage system receives timing pulses from a means for generating reference pulses connected to a rotary storage medium. Variations in the angular velocity and phase of the rotating storage medium result in corresponding variations of frequency and phase of a voltage-controlled oscillator, which controls the write or record circuitry. During readout, the phase-locked oscillator is employed to locate the selected data records accurately.

3,577,133
DISC MEMORY SYSTEM INCLUDING UNITARY SUPPORT MEMBER AND PRINTED CIRCUIT BOARD
Allen E. Garfein, Woodland Hills, and Irwin B. Garfein, Los Angeles, Calif., assignors to Engineered Data Peripherals Corporation, Santa Monica, Calif.
Filed Nov. 19, 1968, Ser. No. 776,936
Int. Cl. G11b *5/48*
U.S. Cl. 340—174.1 **16 Claims**



The present invention is directed to a disc memory system which includes a magnetic memory disc and the companion electronics for recording and reading out the information on the memory disc and wherein the bulk of the electronics is located on a single printed circuit board mounted adjacent to and in a parallel plane to the plane of the memory disc. All of the electronics except the diode boards are on this single printed circuit board. A single unitary casting supports all of the major components of the disc memory system such as the motor, shaft, magnetic heads, etc., and all of the major tolerances which must be maintained in order to insure the proper function of the interrelated parts of the disc memory system are held on this single casting. The memory disc is maintained in a first sealed compartment which is supported on the single casting and the single printed circuit board is maintained in a second sealed compartment separate from the first sealed compartment.

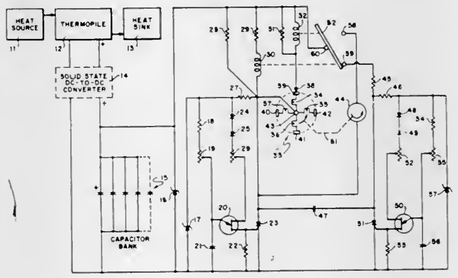
3,577,134
METHOD OF OPERATING A CONVERTIBLE MEMORY SYSTEM
Robert J. Bergman, St. Paul, Minn., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Sept. 16, 1969, Ser. No. 858,372
Division of Ser. No. 671,026, Sept. 27, 1967, Pat. No. 3,480,929.
Int. Cl. G11c *11/14*, **G11c** *5/02*
U.S. Cl. 340—174 **8 Claims**



A magnetizable memory element that includes a plurality of layers of thin-ferromagnetic-films that are formed in a stacked, superposed relationship about and sandwiching therebetween a current conducting drive line. The magnetizable layers have opposing sides that overlap the drive line to form closely coupled portions on both sides of the enveloped drive line for creating a substantially closed flux path about the enveloped drive line. The layers' easy axes are skewed away from the magnetic axis, i.e., a line orthogonal to the longitudinal axis, of the enveloped drive line providing single-domain rotational switching of the layers' magnetization during both the write and read operations. Pairs of layers

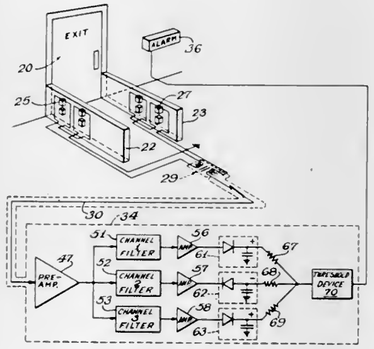
on each side of the enveloped drive line are comprised of layers of relatively high and low H_k characteristics whereby an energized enveloped drive line substantially effects only the low H_k layers upon readout providing nondestructive readout of the information stored in the high H_k layers.

3,577,135
UNATTENDED FLASHING NAVIGATION BEACON SYSTEM
Donald B. Steen, Baltimore, Md., assignor to the United States of America, as represented by the Secretary of the Navy
Filed Mar. 26, 1968, Ser. No. 716,154
Int. Cl. H05b *41/46*
U.S. Cl. 340—251 **11 Claims**



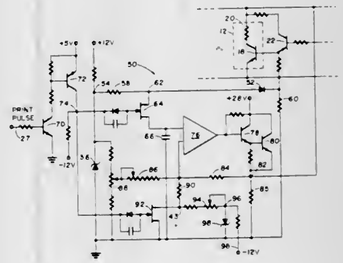
An unattended flashing navigation beacon system comprising a solid-state thermoelectric generator to supply power to the system, a Zener voltage limiter to regulate the system voltage, a capacitor bank to store power supply energy during eclipse time, a solid-state flasher, a motorized lamp changer, a first time delay circuit means for controlling the amount of time said flasher is actuated and a second time delay circuit means for controlling the amount of time said flasher is eclipsed. The flasher and lamp changer are interconnected such that a relay is activated when a lamp burns out. The relay initiates operation of the lamp changer motor and simultaneously prevents the flasher from switching to the eclipse state until a new lamp bulb is placed into position at which time the relay turns off the motor and allows the flasher to resume operation.

3,577,136
SHORT-RANGE SIGNALING SYSTEM
John E. Wolf, Marengo, Ill., assignor to Security Systems, Inc.
Filed Aug. 4, 1967, Ser. No. 658,491
Int. Cl. G08b *13/24*; **H03b** *5/30*
U.S. Cl. 340—280 **15 Claims**



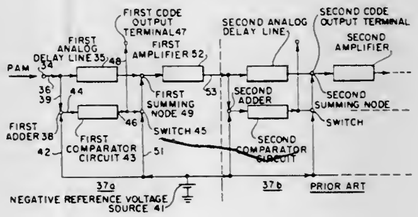
A merchandise protection system in which an encapsulated, magnetically latched reed is hidden on the article to be protected against theft. Magnets placed adjacent an exitway from the protected enclosure release the reed, allowing it to thereafter vibrate at a predetermined frequency. The reed produces a magnetic disturbance which is detected by a sensitive, frequency-selective pickup device which, in turn, actuates an alarm.

3,577,137
TEMPERATURE COMPENSATED ELECTRONIC DISPLAY
James Brennan, Jr., Houston, Tex., assignor to Texas Instruments, Incorporated, Dallas, Tex.
Filed Dec. 31, 1968, Ser. No. 788,178
Int. Cl. H04l *15/34*
U.S. Cl. 340—324 **20 Claims**



A high speed electronic display system having a circuit for adjusting the power applied to a thermal display matrix during a printing cycle based upon the temperature of the print head. In one embodiment, the temperature of a matrix of air isolated semiconductor means is sensed by a diode diffused in an adjacently mounted integrated circuit immediately prior to the print cycle, and the power applied to drive the matrix during the print cycle is adjusted in accordance with the offset voltage across the diode. In another embodiment, the temperature of the matrix of elements is estimated using a temperature sensing element located on the heat sink and correcting the sensed temperature to compensate for the repetition rate of the print cycle, the number of elements activated during each print cycle, the rate at which heat is transferred to the heat sensing element, and the rate at which heat is dissipated from the heat sensing element. There is a single sensor for the thermal display matrix.

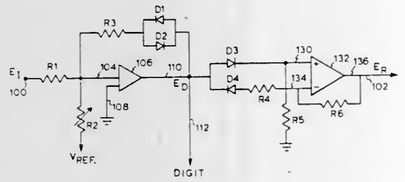
3,577,138
FEEDBACK TYPE PULSE AMPLITUDE MODULATION CODING SYSTEM
Masao Kawashima; Shunroku Sasaki, Yokohama-shi, and Syoichi Kurita, Kawasaki-shi, Japan, assignors to Fujitsu Limited, Kawasaki-shi, Japan
Filed Dec. 13, 1966, Ser. No. 601,467
Claims priority, application Japan, Dec. 16, 1965, 40/77471
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 **8 Claims**



A pulse amplitude modulated signal is held in a first holding circuit and is supplied to a summing node via a switch. A reference signal from a reference signal source is also sup-

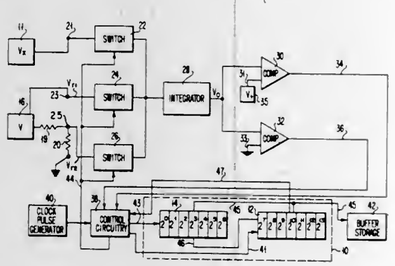
plied to the summing node which provides a difference signal indicative of the difference in amplitude between the pulse amplitude modulated signal and the reference signal. An amplifier amplifies the difference signal and a comparator determines the polarity of the difference signal and provides a corresponding binary output signal. The comparator is also connected to the reference signal source in a first feedback path. A second holding circuit is connected in a second feedback path between the amplifier and the switch and the amplified difference signal is supplied to the summing node via the switch in selective alternation with the pulse signal.

3,577,139
ANALOG-TO-DIGITAL CONVERTER
Roy P. Foerster, Thousand Oaks, Calif., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.
Filed June 12, 1967, Ser. No. 645,191
Int. Cl. H03k *13/02*
U.S. Cl. 340—347 **10 Claims**



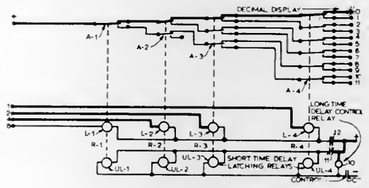
A converter responsive to analog input signals for providing "reflected binary" or Gray code output signals. The converter is comprised of a plurality of substantially identical stages connected in cascade. Each stage provides both a digital output signal and a residual analog output signal in response to an analog input signal applied thereto. The level of the residual output signal provided by each stage is determined by a V-shaped transfer characteristic defined by a differential amplifier therein. The residual output signal from each stage constitutes the input signal to a subsequent stage.

3,577,140
TRIPLE INTEGRATING RAMP ANALOG-TO-DIGITAL CONVERTER
Hans Bent Aasnaes, Trondheim, Norway, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 27, 1967, Ser. No. 649,161
Int. Cl. H03k *13/02;* **H03k** *13/20*
U.S. Cl. 340—347 **14 Claims**



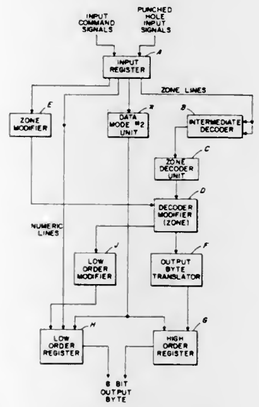
An integrating ramp voltage type analog-to-digital converter apparatus is disclosed. An unknown analog voltage is integrated for a fixed time period. During subsequent, successive integration of reference voltages, pulses are gated into a partitioned counter, filling the higher order positions in that counter first. The counter then contains a digital representation analog the analog voltage.

3,577,141
BINARY TO DECIMAL TREE RELAY DECODER CIRCUIT WITH MEMORY DISPLAY
Eusebio V. Quintero, Greenville, S.C., assignor to United Merchants and Manufacturers, Inc., New York, N.Y.
Filed Nov. 14, 1968, Ser. No. 775,737
Int. Cl. G06f *5/00*
U.S. Cl. 340—347 **4 Claims**



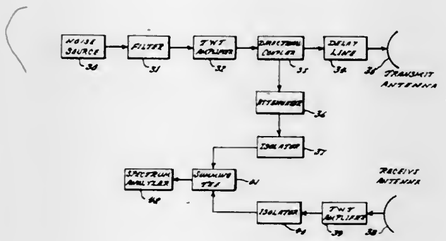
A binary to decimal decoding or translating circuit for the displaying or storing of decimal data from binary inputs uses latching relays in a tree relay type circuit, the selective energization of the latching coils for the establishment of paths to produce particular decimal displays being dependent upon operation of unlatching coils within a relatively short time period followed by operation of a control nonlatching relay within a longer but relatively brief time period such that new binary data may be fed into or removed from the circuit while previously fed binary data is held displayed or stored in memory.

3,577,142
CODE TRANSLATION SYSTEM
John V. McMillin, Iowa City, Iowa, assignor to Westinghouse Learning Corporation
Filed Feb. 28, 1969, Ser. No. 803,160
Int. Cl. H03k *13/24;* **H04i** *3/00;* **G06f** *5/02*
U.S. Cl. 340—347DD **11 Claims**



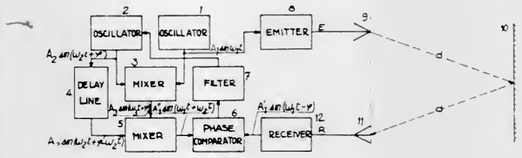
A system for translating a 12-bit per byte digital code into an 8-bit per byte code so that the latter may be transmitted on 8-bit binary lines. The system is used to translate information electronically from a standard punched-hole card, which is normally in a 12-row, 80-column format, into an extended binary-coded decimal interchange code that can be more easily transmitted between computer channels and other devices such as card readers and punches.

3,577,143
EXTENDED RANGE SPECTRUM ANALYSIS RADAR
Joseph L. Poirier, 26 Brian Road, and John K. Schindler, 6 Nevada Drive, Chelmsford, Mass.
Filed Apr. 8, 1969, Ser. No. 814,334
Int. Cl. G01s *9/24*
U.S. Cl. 343—12R **13 Claims**



A radar system in which the return signal is added to a reference signal derived from the original transmitted signal. The power spectrum of the sum signal is modulated. The modulation frequency is a linear function of the range and is measured to determine the range to the target. To extend the maximum range of the system the reference signal is delayed relative to the received signal, and to decrease the minimum range the received signal is delayed relative to the reference signal.

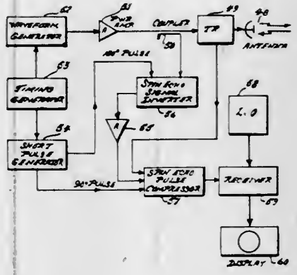
3,577,144
DISTANCE MEASURING SYSTEMS
Pierre Girault, Paris, France, assignor to CSF Campagnie General De Telegraphie Sans Fil
Filed Oct. 10, 1968, Ser. No. 766,559
Claims priority, application France, Oct. 31, 1967, 126.610
Int. Cl. G01s *9/23*
U.S. Cl. 343—14 **4 Claims**



A distance measuring system comprising means for transmitting a sinusoidal wave or a sinusoidally modulated wave and receiving the same after reflection on a target and means for converting the phase shift, due to the propagation of this wave out and back, into a measuring signal the frequency of which is proportional to the travelling distance of said wave.

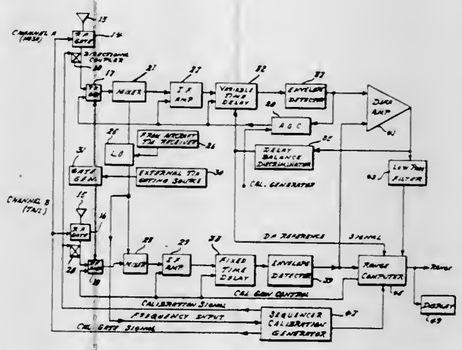
3,577,145
RADAR SYSTEM SPIN ECHO CORRELATOR
Robert A. Worden, Eaton; Hugh H. Hair, Liverpool; Carl W. Gerst, Skaneateles, and Benadict Viglietta, Clinton, N.Y.
Filed Aug. 13, 1969, Ser. No. 849,719
Int. Cl. G01s *9/24*
U.S. Cl. 343—17.2PC **4 Claims**

The spin properties of paramagnetic materials are utilized to provide a correlator of radar signals. Paramagnetic materials having an in homogeneous resonance line and relatively long spin-spin and spin-lattice relaxation times such as phosphorous-doped silicon are placed into a coupling structure which couples RF energy to the magnetic spin system. Such a structure can be a simple tuned LC oscillator for low-



frequency operation or a microwave cavity or slow wave structure for microwave operation.

3,577,146
PASSIVE MONOPULSE RANGING SYSTEM
Michael Freier, and Leonard P. Balazer, Sunnyvale, Calif.
Filed Apr. 16, 1969, Ser. No. 817,616
Int. Cl. G01s *5/14;* **G01s** *11/00*
U.S. Cl. 343—112 **3 Claims**

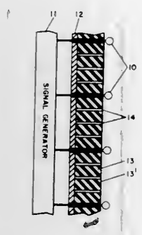


A monopulse ranging system where incoming signals from two antennas are converted to an intermediate frequency and passed through corrective delays with one of the delays being controlled by a delay balance discriminator. The detected envelopes of the signals are fed to a differential amplifier, the output thereof being fed to a range computer and the delay balance discriminator detects the differences to be fed back to one of the delay controls.

3,577,147
PHASED ARRAY ANTENNA HAVING A WAVE SPEEDING GROUND PLANE
Peter W. Hannan, Smithtown, N.Y., assignor to Hazeltine Corporation
Filed Sept. 8, 1969, Ser. No. 855,900
Int. Cl. H01q *13/00*
U.S. Cl. 343—778 **13 Claims**

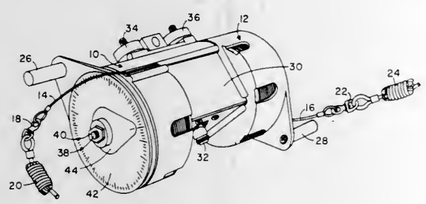
A phased array antenna consisting of a plurality of radiating elements associated with a ground plane and including a

reactive impedance for reducing the catastrophic effect produced by end-fire grating lobes and surface waves. A series capacitance or shunt inductance is placed in the trans-



mission path formed by the ground plane and free space in order to increase the phase velocity of any TM wave that might propagate along the ground plane so that it is at least equal to the phase velocity of a free space wave.

3,577,148
PORTABLE REELABLE DIPOLE ANTENNA HAVING FREQUENCY CALIBRATED DIAL
Donald L. Holzschuh, Richardson, and Betty M. Wicker, Richardson, Tex., assignors to Collins Radio Company, Dallas, Tex.
Filed Nov. 6, 1968, Ser. No. 773,826
Int. Cl. H01q *9/16*
U.S. Cl. 343—821 **1 Claim**



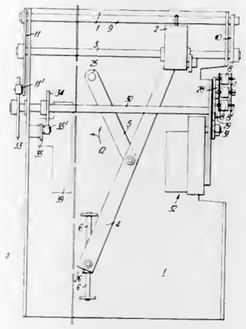
An adjustable dipole antenna which is compact, portable and easily assembled in the field including reel means for accommodating two lengths of wire and calibrated dial means mechanically coupled to the reel means for indicating an operating frequency as the two lengths of wire are unreeled. Impedance matching means is provided to match the balanced antenna impedance to the unbalanced impedance of the input feedline.

ERRATUM

For Class 346—46 see:
Patent No. 3,577,131

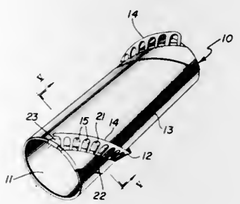
3,577,149
COLOR PRINTING APPARATUS FOR POTENTIOMETRIC RECORDING INSTRUMENTS
Ugo Carpino, Milan, Italy, assignor to Pio Guardigli, Milan, Italy
Filed Nov. 15, 1968, Ser. No. 776,044
Claims priority, application Italy, Nov. 20, 1967, 22899/67
Int. Cl. G01d *9/34*
U.S. Cl. 346—46 **6 Claims**

Writing apparatus in multicurve electronic potentiometric recording instruments to record the values of a plurality of variables on a continuous movement single chart. The writing apparatus comprises a movable writing carriage, means for inking in a plurality of colours and changeover means for selecting the variables. The writing carriage moves parallel to itself to assume the stamping and inking position and oscil-



lates at right angles to the direction of movement to effect the stamping and inking operations.

3,577,150
RECORDING HELIX
Milton Alden, Needham, Mass., assignor to Alden Research Foundation, Brockton, Mass.
Filed Jan. 22, 1969, Ser. No. 793,132
Int. Cl. G01d *15/06*
U.S. Cl. 346—139 **11 Claims**



This invention relates to a recording helix and, more particularly, to drum for use in a graphic communications recorder having a helical electrode mounted thereon.

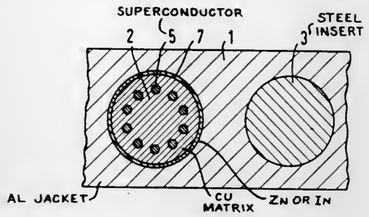
ERRATA

For Classes 174—128 thru 346—75 see:
Patent Nos. 3,577,151 thru 3,577,198

3,577,151
FULLY OR PARTLY STABILIZED CONDUCTOR COMPRISED OF SUPERCONDUCTING AND NORMAL-CONDUCTING METALS
Gunther Bogner, Tennenlohe, and Richard Maier, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany
Filed Apr. 1, 1969, Ser. No. 812,040
Claims priority, application Germany, Apr. 6, 1968, P 17 65 132.0
Int. Cl. H01v *11/04;* **H01f** *7/22*
U.S. Cl. 174—128 **11 Claims**

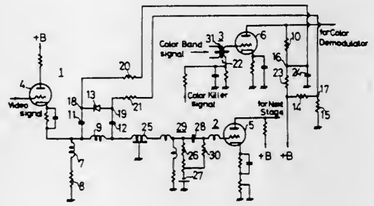
Described is a fully or partly stabilized conductor combined of superconducting and normal-conducting metals. The conductor is characterized in that several superconductors with small cross section are combined with a copper matrix to form a multicore conductor. The superconductors

are completely embedded in the copper matrix and in metallurgical connection therewith. Several multiconductors are



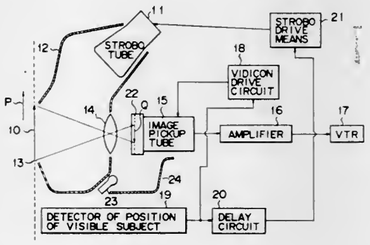
enclosed with one aluminum jacket and are electrically and thermally connected with the same.

3,577,152
ARRANGEMENT FOR COLOR TELEVISION RECEIVER
Koichi Yahagi, Kawasaki-shi, Japan, assignor to Nippon Columbia Company, Limited
Continuation-in-part of application Ser. No. 760,603, Sept. 18, 1968. This application June 10, 1969, Ser. No. 834,220
Int. Cl. H04n *9/12*
U.S. Cl. 178—5.4 **11 Claims**



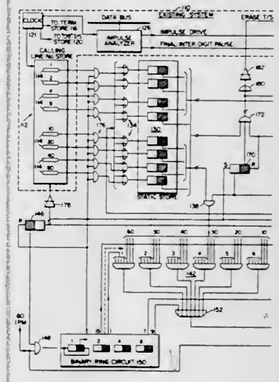
A video amplifier circuit arrangement for a color television receiver which is capable of effectively meeting a contradictory relationship between the production of a picture with high resolution during reception of black-and-white television broadcast and the production of a color picture free from dotted pattern during reception of color television broadcast.

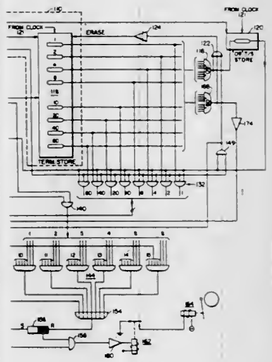
3,577,153
IMAGE PICKUP APPARATUS
Motoi Yagi, Zushi-shi, and Yasuo Takemura, Kawasaki-shi, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan
Filed Aug. 19, 1968, Ser. No. 753,638
Claims priority, application Japan, Aug. 23, 1967, Jan. 18, 1968, 42/53768; 42/53767; 42/71998; 43/2337
Int. Cl. H04n *7/18, 5/30*
U.S. Cl. 178—7.2 **8 Claims**



A position detector detects the presence of a travelling foreground subject and then enables a light projector, such as a Strobo tube, to provide short duration flashes when the foreground subject is at an optimum predetermined position relative to the position of the light projector. A photoelectric conversion device is provided to pick up an image of the illuminated foreground subject, signals corresponding to the picked up image being processed and, if desired, stored to provide a permanent record.

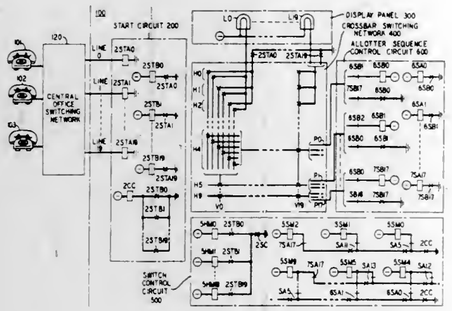
3,577,154
CODE CALL FACILITY FOR ELECTRONIC TELEPHONE EXCHANGE
William F. Bartlett, Irondequoit, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.
Filed Apr. 1, 1969, Ser. No. 811,757
Division of Ser. No. 557,042, June 13, 1966, Pat. No. 3,459,896.
Int. Cl. H04m *11/02*
U.S. Cl. 179—18 **3 Claims**





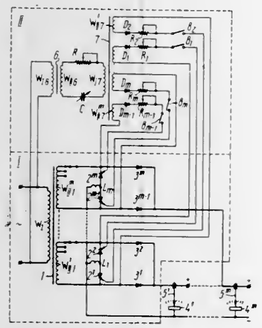
A telephone exchange code call circuit wherein a static store applies gating signals to a selected gate in each of two sets of gates, the first set designating a tens digit and the second set designating a units digit. The gates in the first and second set receive time spaced signals in a predetermined sequence so that the selected gate in the first set is first enabled and the selected gate in the second set is subsequently enabled, by the simultaneous presence of the gating and timed spaced signals. An output circuit, responsive to the enabled gates in the first and second set produce a code call signal corresponding to that in the static store.

3,577,155
ALLOTTER CIRCUIT FOR SEQUENTIAL INDICATION OF INCOMING TELEPHONE CALLS
Witold E. Swierczewski, Daly City, Calif., assignor to American Telephone and Telegraph Company, New York, N.Y.
Filed Jan. 15, 1969, Ser. No. 791,395
Int. Cl. H04m *5/04*
U.S. Cl. 179—27 **7 Claims**



A telephone call allotter circuit is disclosed for lighting the line lamps on an attendant console or switchboard, one at a time, in the same sequence in which calls arrive. A crossbar switch is interposed between the line relays and the line lamps. The horizontal magnets of the switch are operated sequentially in the order in which calls arrive. The line lamp of each line is associated with a respective vertical of the crossbar switch. Transfer contacts of relays controlled by the crossbar switch permit only one line lamp at a time to operate.

3,577,156
PULSE GENERATOR
Boris Evgenievich Paton, Ulitsa Kotsjubinskogs, 9, Kv. 21; Vladimir Konstantinovich Lebedev, Ulitsa Engelsa, 25, Kv. 12; Petrovich Pavel Sheiko, Ulitsa Tatarskaya 2-b Kv. 12, and Mikhail Petrovich Pashulya, Ulitsa Konstantinovskaya-61, Kv. 11, Kiev, U.S.S.R.
Filed Mar. 10, 1969, Ser. No. 805,656
Claims priority, application U.S.S.R., June 14, 1968, 1250703
Int. Cl. B23k *9/10*
U.S. Cl. 219—131 **2 Claims**

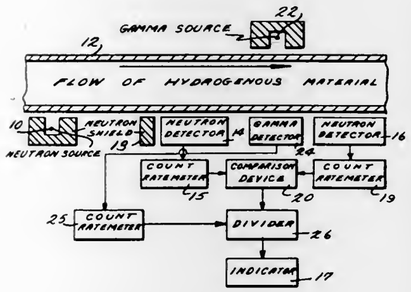


A novel pulse generator for pulse arc welding and building up of parts by one or several arcs is disclosed, the novel generator comprising a pulse unit and a control unit. The pulse unit comprises a transformer, the number of secondary windings of which corresponds to the number of welding arcs, or the number of secondary windings is half the number of welding arcs, so as to ensure simultaneous operation of the required number of welding arcs.

3,577,157
INTEGRATING DEVICE FOR USE IN INDUSTRIAL PROCESS CONTROL APPARATUS
Robert J. Robinson, Lexington, Mass., assignor to The Foxboro Company, Foxboro, Mass.
Division of Ser. No. 500,612, Oct. 22, 1965, Pat. No. 3,441,053.
Filed May 16, 1968, Ser. No. 749,230
Int. Cl. G06g *7/18;* **F16k** *31/143*
U.S. Cl. 235—183 **13 Claims**

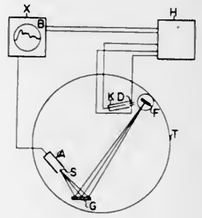
An industrial process control system wherein a digital data processor controls process conditions in a time shared manner by periodically sampling the conditions and then communicating in sequential order with the process regulating means by use of a series of constant amplitude command signals whose time duration is proportional to the change to be made in the process regulating means and a device for translating a command signal of this type to a suitable control signal for changing the setting of the process regulating means.

3,577,158
MASS FLOW RATE MEASURING UTILIZING THE SCATTERING CROSS SECTION OF A MATERIAL FOR FAST NEUTRONS
Linus K Hahn, Columbus, Ohio, assignor to Industrial Nucleonics Corporation
Continuation of application Ser. No. 522,778, Jan. 24, 1966, now abandoned. This application Jan. 7, 1969, Ser. No. 792,201
Int. Cl. G01n *23/12*
U.S. Cl. 250—43.5 **17 Claims**



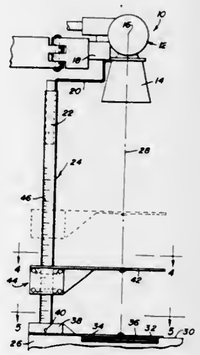
Measuring mass flow rate of a fluid material having a high scattering cross section for fast high energy neutrons by radiating the material with such neutrons which are slowed to lower energy thermal neutrons and detecting the thermal neutrons downstream to effect a determination therefrom of the mass flow rate. For a more accurate determination of the mass flow rate, a second thermal neutron detector downstream has its output compared to the first detector output. Further, a gamma source and detector is employed to derive the density of the material and to obtain the velocity thereof by division of the mass flow by the density.

3,577,159
DIFFRACTION GRATING X-RAY SPECTROMETER WHEREIN AN ELECTRON BEAM IS SCANNED ACROSS A FIXED X-RAY EMITTING ELEMENT
Masao Sawada, 525 Ikejiri, Sayama-cho Minami Kawachi-gun, Osaka-Fu, Japan
Filed Jan. 2, 1968, Ser. No. 694,933
Int. Cl. G01n *23/22*
U.S. Cl. 250—51.5 **6 Claims**



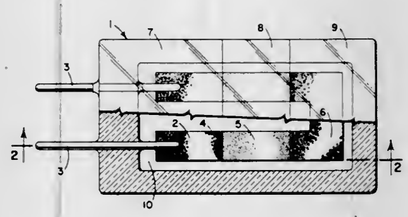
A diffraction grating spectrometer having an X-ray tube in a fixed position, the ray-source of which is rapidly moved back and forth on a definite curve. Diffracted beams from the grating surface are focused on a slit of a fixed electronic counter and the intensities of the spectral distribution are observed or measured by a suitable means. The positions of the ray-source and the counter are the reverse of those in the previously known spectrometers.

3,577,160
X-RAY GAUGING APPARATUS WITH X-RAY OPAQUE MARKERS IN THE X-RAY PATH TO INDICATE ALIGNMENT OF X-RAY TUBE, SUBJECT AND FILM
James E. White, 7342 E. Thomas, Scottsdale, Ariz. 85257
Filed Jan. 10, 1968, Ser. No. 696,730
Int. Cl. G03b *41/16*
U.S. Cl. 250—59 **13 Claims**



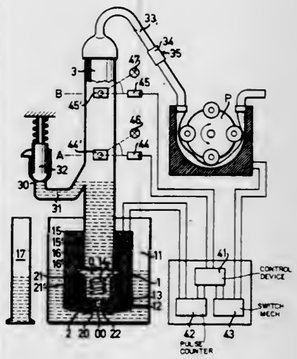
X-ray photographic apparatus through which reference data is photographically recorded on the film exposed to the X-rays together with the image of a subject being diagnosed. A locator for producing landmark images is also mounted on the subject, so that photographic records of the subject may be evaluated in light of both image distortion due to geometric misalignment and variation in the anatomy of the subject.

3,577,161
RADIATION DOSIMETER HAVING SENSITIVE MATERIAL CONTAINING LITHIUM HYDRIDE
Martin Oberhofer, Taino, and Jurgen Jaspert, Cittiglio, Italy, assignors to European Atomic Energy Community (Euratom), Brussels, Belgium
Filed Dec. 8, 1967, Ser. No. 689,098
Claims priority, application Netherlands, Dec. 21, 1966, 66/17951
Int. Cl. G01t *1/11, 3/00*
U.S. Cl. 250—71 **10 Claims**



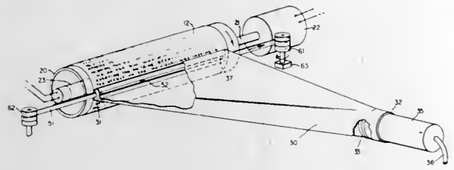
A radiation dosimeter based on the phenomenon of thermoluminescence. The sensitive material in the dosimeter is, at least in part, lithium fluoride, and to the sensitive material is added lithium hydride.

3,577,162
AUTOMATIC COUNTING SYSTEM FOR FLUID SUSPENDED PARTICLE
Hermann Gaehwiler, and Kurt Schoen, Zurich, Switzerland, assignors to Contraves AG., Zurich, Switzerland
Filed Mar. 21, 1969, Ser. No. 809,332
Claims priority, application Switzerland, Apr. 19, 1968, 5869/68
Int. Cl. G01n *21/26*
U.S. Cl. 250—218 **4 Claims**



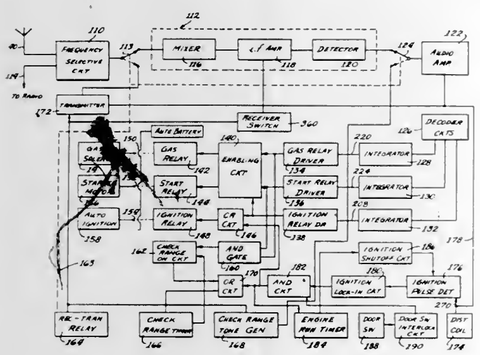
A novel counting system for counting particles suspended in a fluid medium is disclosed. The counting system comprises electrode means for sensing the presence of particles in a fluid means and producing a signal representative thereof; conveying means for conveying the fluid medium through said electrode means into a measuring tube; an upper and a lower spaced apart fluid level sensing means disposed at the measuring tube; and counter means coupled with said sensing means and said electrode means for counting said signals, said counter means being turned on by said lower sensing means when the fluid reaches the lower level in the measuring tube, and being turned off by said upper sensing means when the fluid reaches the upper level in the measuring tube.

3,577,163
PRINT READER COMPRISING TWO MUTUALLY ORTHOGONAL SCANNING SLITS AND A DRUM HAVING A LIGHT TRANSMISSIVE SURFACE
William J. Riffe, R.R. #2, Short Line Pike, Berea, Ky.
Filed May 6, 1969, Ser. No. 822,155
Int. Cl. G01n *21/30;* **H01j** *3/14, 5/02*
U.S. Cl. 250—219 **3 Claims**



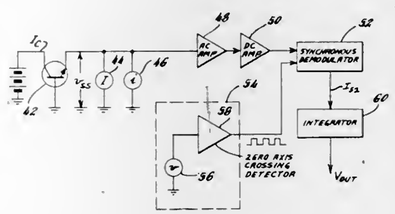
An apparatus is disclosed for converting printed material of any typefont into electrical signals suitable for conversion and use with a digital computer. Light transparent paper, with light impervious printed matter thereon, is placed on a roll and illuminated uniformly from within such roll. The page is scanned on a line to line basis by rotating the roll intermittently, and on a character by character basis by a motor driven tape carrying a light slit. The resulting light signal is converted into an analog electric signal representative of the scanned print, which can be converted to digital form for use in electronic data processing equipment.

3,577,164
REMOTE CONTROL STARTING SYSTEM
Giuseppe Re Baratelli, Glenview, and Theodore J. Galvani, Deerfield, Ill., assignors to Ramostar Corporation, Deerfield, Ill.
Filed June 5, 1968, Ser. No. 734,744
Int. Cl. F02n *11/08*
U.S. Cl. 290—38 **13 Claims**



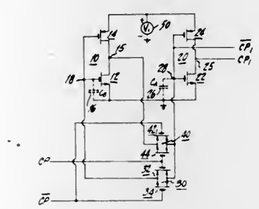
A system for remotely controlling electrical devices as in the starting of automobiles and the like employing a transceiver, a receiver-transmitter and an actuating solenoid. The transceiver includes circuitry adapted to transmit selected radio frequency signals for performing selected functions during starting of the automobile. The receiver-transmitter includes circuitry adapted to transmit a signal to the transceiver upon receipt of a first check range signal from the transceiver, energize the auto ignition circuit and energize the auto starter upon receipt of a second signal from the transceiver, and energize the actuating solenoid upon receipt of a third signal. The solenoid is adapted to actuate the fuel linkage upon being energized. The receiver-transmitter circuit is further adapted to limit the running time of the engine upon starting, transmit an intermittent signal to the transceiver during initial engine running, and stop the engine upon opening a door of the auto during the initial engine running period.

3,577,165
LINEAR SCANNING ARRANGEMENT FOR A CYCLOIDAL MASS SPECTROMETER
Bradley A. Helliwell, Mountain View, and Donald D. Briglia, Palo Alto, Calif., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed May 31, 1968, Ser. No. 733,564
Int. Cl. H03k *5/00, 7/00, 9/00*
U.S. Cl. 307—228 **9 Claims**



A partial pressure gauge scanning circuit arrangement for generating an electrostatic ion beam deflection voltage having a deflection waveform segment defined by the function $V=f(1/)$, where V=deflection voltage and t=time, includes a circuit means having a nonlinear transfer characteristic, the derivative of which is proportional to the function $f(1/t)$. Circuit means apply an alternating signal of frequency f_1 and a signal of relatively lower frequency f_2 to the nonlinear circuit means in a manner for providing an amplitude modulated output signal of frequency f_1. The output signal exhibits a modulation envelope defined by the differential of the logarithmic characteristic. Circuit means are provided for demodulating and integrating the amplitude modulated signal to provide a scanning output signal having a waveform defined as an inverse function of time.

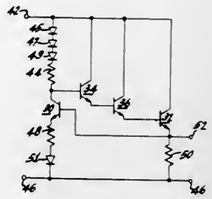
3,577,166
C-MOS DYNAMIC BINARY COUNTER
Abraham K. Yung, East Brunswick, N.J., assignor to RCA Corporation
Filed Sept. 17, 1968, Ser. No. 760,218
Int. Cl. H03k *3/26*
U.S. Cl. 307—279 **14 Claims**



A dynamic flip-flop comprising two inverter means and two switching means is described. The switching means couple, by different conduction paths, the input node of one inverter means to the input node and to the output means of the other inverter. The switching means are alternately enabled by a clocking signal varying at a first rate causing the signals at the inputs and outputs of both inverter means to vary at one half said first rate.

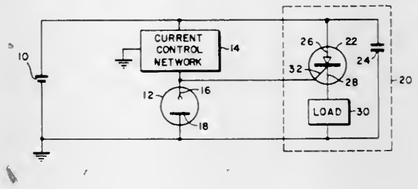
The temporary or momentary storage provided by the capacitance at the input node of an inverter stage, coupled with the single pole, double throw action of the switching means, enables the design of a dynamic binary counter using a minimum number of components.

3,577,167
INTEGRATED CIRCUIT BIASING ARRANGEMENTS
Jack Avins, Princeton, N.J., assignor to RCA Corporation
Filed Feb. 29, 1968, Ser. No. 709,274
Int. Cl. H02m *3/14*
U.S. Cl. 307—296 **10 Claims**



A low output impedance bias supply for integrated circuit amplifier configurations capable of delivering an output voltage that is a constant fraction of a power supply potential. Two transistors are connected in a degenerative feedback arrangement with a pair of resistors and with a pair of semiconductor diodes, the ratio of the resistors determining the fractional output voltage developed and the diodes serving to provide a low output impedance at high frequencies.

3,577,168
LONG DELAY TIMING SYSTEM
William J. Tuten, and Godfrey R. Gauld, Richmond, Ind., assignors to Avco Corporation, Richmond, Va.
Filed June 21, 1968, Ser. No. 739,011
Int. Cl. H03k *17/28*
U.S. Cl. 307—293 **7 Claims**

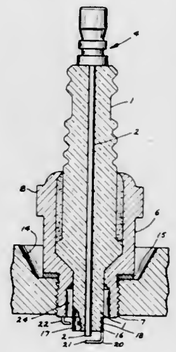


The disclosure illustrates a longterm timing system comprising a battery coupled to an electrochemical cell through a pulsing circuit. The electrochemical cell is of the type that requires current flow above a minimum value to enable proper operation. The pulses from the pulsing circuit have a peak substantially greater than the minimum permissible current level but the pulses are substantially spaced in time. The resultant average current flow is then low enough so that the time at which the impedance of the electrochemical cell changes is greatly increased.

3,577,169
COEXISTING CRYSTALLINE SOLUTION PHASES ACTIVATED BY DIVALENT EUROPIUM
Thomas L. Barry, Beverly, Mass., assignor to Sylvania Electric Products, Inc.
No. drawing. Continuation-in-part of application Ser. No. 506,868, Nov. 8, 1965, now abandoned. This application Aug. 5, 1968, Ser. No. 750,122
Int. Cl. H01j *1/63*
U.S. Cl. 313—109 **3 Claims**

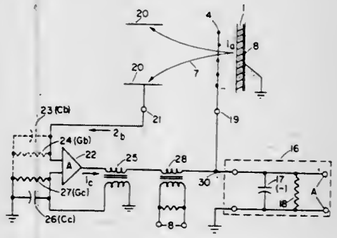
A blue-emitting Eu^{2+} activated, fluorescent phosphor of coexisting crystalline phases of the spinel structure of $MgAl_2O_4$ and the corundum structure of $\alpha\ Al_2O_3$ is useful in fluorescent and mercury vapor lamps. The essential cations of each structure are Al, Mg and Si. In the corundum phase, the Si^{4+} and Mg^{2+} ions displace Al^{3+} ions, are disposed in the corundum lattice of Al_2O_3 and are present in significant quantities, but less than the limit of mutual solubility of the Si^{4+} and Mg^{2+} ions in the corundum lattice. In the spinel phase, Si atoms and site vacancies displace Mg atoms in the spinel lattice and are present in significant quantities, but less than the limit of solubility of Si atoms and vacancies in the spinel lattice.

3,577,170
DOUBLE-GAP SPARK PLUG
Gustav P. Nylen, 5868 Picker St., Arlington, Calif.
Filed Jan. 15, 1969, Ser. No. 791,446
Int. Cl. H01t *13/46, 13/22*
U.S. Cl. 313—123 **2 Claims**



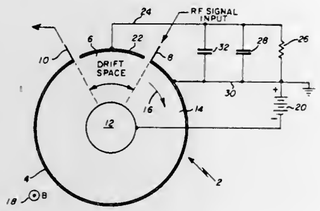
A spark plug having two spark gaps connected in series, the first gap being formed between the main, positive electrode extending lengthwise through the plug and a first electrode finger attached to a conductor sleeve embracing the lower end of the porcelain insulating stem of the plug. The second spark gap is defined between the conductor sleeve and a second electrode finger attached to the conductive base portion of the plug which is secured in threaded engagement with an engine block.

3,577,171
SYSTEM USING A MODIFIED ULTRASONIC IMAGING TUBE
William R. Turner, Rockville, Md., assignor to Vitro Corporation of America, New York, N.Y.
Filed Sept. 3, 1968, Ser. No. 756,866
Int. Cl. G01n *9/24, 29/00;* **H01j** *29/41, 31/48*
U.S. Cl. 315—9 **2 Claims**



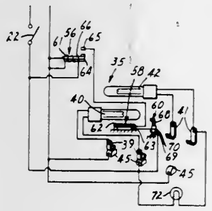
An improved ultrasonic to visual signal conversion system utilizing a cathode ray tube, said tube having a piezoelectric face plate or conversion plate, a controlling screen adjacent thereto and a collector electrode back of the screen for receiving current generated by the conversion plate. The collector current is utilized to control a video tube synchronized with the first tube, and is shunted in feedback fashion to the screen to control terminal admittance thereof and thereby increase the signal to noise ratio of the system as well as to raise the effective signal level.

3,577,172
SELF-QUENCHING ELECTRODE FOR CROSSED FIELD TRAVELING WAVE DEVICES
Edward C. Dench, Annisquam, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Nov. 28, 1969, Ser. No. 880,580
Int. Cl. H01j *25/34*
U.S. Cl. 315—39.3 **11 Claims**



A crossed field device of the reentrant electron beam and nonreentrant nonresonant transmission network type having means for substantially automatically quenching electron-traveling wave interaction initiated by electromagnetic energy signal pulses during nonoperation intervals. Such means are disposed adjacent to the drift space area of the interaction region and include a lumped capacitive-resistive network coupled to electrode means to rapidly terminate electron emission.

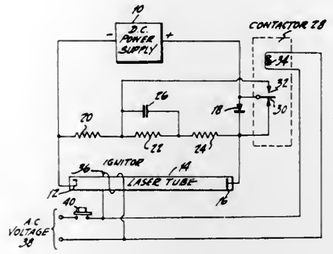
3,577,173
LAMP FAILURE DETECTION AND CHANGE DEVICE
Jack P. Blomgren, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 10, 1969, Ser. No. 790,415
Int. Cl. F21v *19/04;* **H05h** *37/04*
U.S. Cl. 315—88 **5 Claims**



A projector which has a device for automatically replacing an expired main lamp with a spare lamp. The main lamp and the spare lamp are socketed in a lamp-changing mechanism which is operated in response to the operation of a lamp failure detector. The detector radiantly senses the failure of the main lamp and automatically activates the lamp-changing mechanism which will remove the main lamp from the focus position, advance the spare lamp into the focus position, and energize the spare lamp.

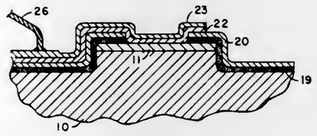
3,577,174
CIRCUIT FOR STARTING AND MAINTAINING A DISCHARGE THROUGH A GAS DISCHARGE TUBE
Richard W. Longsderff, Lancaster, Pa., assignor to RCA Corporation
Filed Sept. 20, 1968, Ser. No. 761,083
Int. Cl. H05b *37/00*
U.S. Cl. 315—170 **9 Claims**

A capacitance, which is charged by the output of a DC power supply, is placed in series aiding relationship with the output of the DC power supply during the start period of a gas discharge tube, i.e., until ignition is achieved and the capacitance discharges through the tube. This permits the required "fill in" or "boost" voltage to be obtained during



starting without drawing excessive peak currents from the power supply when ignition is started.

3,577,175
INDIUM ANTIMONIDE INFRARED DETECTOR CONTACT
Norman I. Gri, Cincinnati, and Eugene T. Yon, Cleveland, Ohio, assignors to Avco Corporation, Cincinnati, Ohio
Division of Ser. No. 723,994, Apr. 25, 1968, Pat. No. 3,483,096.
Filed July 3, 1969, Ser. No. 860,448
Int. Cl. H01l *15/06*
U.S. Cl. 317—237 **2 Claims**

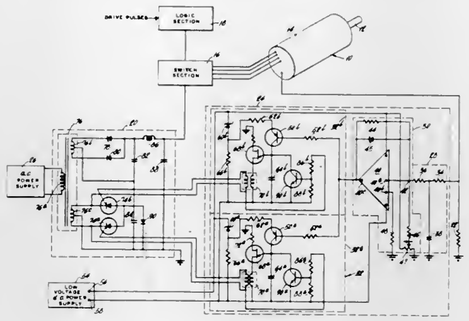


The invention here disclosed is an indium antimonide infrared detector having a novel contact region. The detector comprises a substrate, constituted of an N-material with a P-region fused thereon. An anodized surface oxide film is superimposed over the diffused P-region and over the adjacent surface of the substrate. A silicon oxide layer is disposed over most of the anodized surface oxide film but exposes a portion of the P-region which portion comprises superimposed layers of chromium and gold which form the contact region, said layers masking the contact area and rendering it insensitive to infrared radiation and simultaneously providing a pad to which an electrical connection may conveniently be made.

3,577,176
CONSTANT CURRENT STEP MOTOR SYSTEM
Marvin L. Kreithen, Feasterville, and John J. Lawler, Newportville, Pa., assignors to Compudyne Corporation, Hatboro, Pa.
Filed Apr. 26, 1968, Ser. No. 724,556
Int. Cl. H02p *7/06*
U.S. Cl. 318—432 **7 Claims**

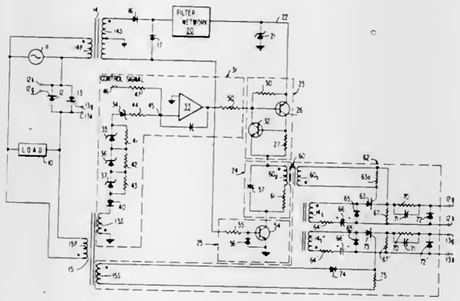
In a control circuit for a step motor, current through the motor windings is sensed by voltage drop across a series resistor. This voltage is used to control a feedback circuit which regulates the power supply in such a way that the output torque of the step motor remains constant. Preferably the potential across the series resistor is compared with a voltage reference. Any error signal generated as a result of a difference is used to generate pulses at a frequency proportional to the error voltage derived from the sensing resistor. These

pulses are synchronized with a rectified alternating current input and are used to determine and select whatever part of



that input, if any, will be used to supplement available current to maintain constant the torque of the step motor.

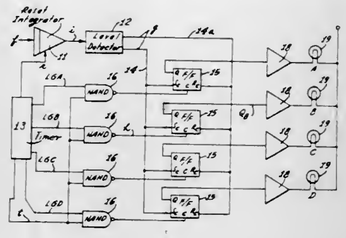
3,577,177
ZERO-CROSSING SILICON CONTROLLED RECTIFIER CONTROL SYSTEM
Clarence Wilson Hewlett, Jr., Hampton, N.H., assignor to General Electric Company
Filed June 26, 1969, Ser. No. 836,816
Int. Cl. G05f *1/44*
U.S. Cl. 323—18 **12 Claims**



A zero-crossing silicon controlled rectifier control system for single-phase, full-wave and three-phase operation. An error signal representing the difference between desired and actual load values in integrated to control a first switch constituted by complementary transistors. A second switch, in series with a pulse generator and the first switch, is conductive during portions of alternate half cycles. Concurrent conduction by both switches energizes the pulse generator which causes a pulse to be generated on the energization. This turns on a first silicon controlled rectifier at the beginning with the positive-going zero crossing. A second silicon controlled rectifier controlled by a trigger circuit conducts during the next half cycle in response to load energization.

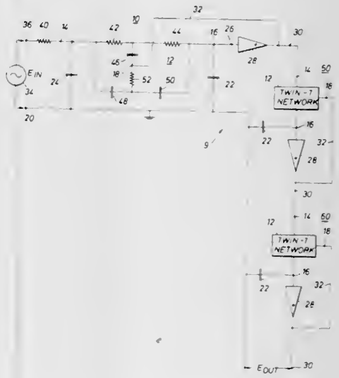
3,577,178
PHASE LOCK INDICATOR FOR PLURAL PHASE LOCK LOOPS
Opie D. Hawley, San Pedro, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.
Filed Apr. 15, 1969, Ser. No. 816,225
Int. Cl. G01r *25/00*
U.S. Cl. 324—83D **6 Claims**

An indicator or monitor is disclosed which shows whether each of a plurality of phase lock loops are locked onto their respective incoming signals or not. The output of a single in-phase detector which is time-shared by the several loops is fed to a reset integrator, then a level detector, and to the set-reset terminals of a plurality of flip-flops. The flip-flops are sequentially clocked by respective timing signals correspond-



ing to the occurrence of the incoming signals associated with their particular loop. The output state of each flip-flop drives an indicator lamp circuit to show the desired locked or not locked condition.

3,577,179
ACTIVE FILTER
Duval West, Houston, Tex., assignor to Geo Space Corporation
Filed Aug. 6, 1969, Ser. No. 847,860
Int. Cl. H03f *1/36*
U.S. Cl. 330—107 **12 Claims**

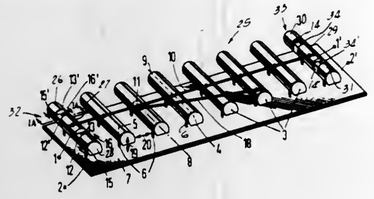


This invention relates to an improved low-pass, active, elliptic-function filter. One state of the filter includes a twin-T, RC network having an input terminal, an output terminal and a feedback terminal. The output terminal is connected to ground through a capacitor; the input terminal is connected to ground through a capacitor; and the feedback terminal is connected to the output terminal of a noninverting amplifier having a gain greater than or equal to unity. The input terminal of the amplifier is connected to the output terminal of the twin-T network. The source of incoming signals is connected through a resistor to the input terminal of the twin-T network. The filter can be made to include two or more stages connected in tandem combination.

3,577,180
ELECTROMECHANICAL FILTER
Hans Albsmeier, and Karl Traub, Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin, Germany
Filed May 1, 1968, Ser. No. 725,790
Claims priority, application Germany, May 12, 1967, S109.856
Int. Cl. H03h *9/26*
U.S. Cl. 333—72 **12 Claims**

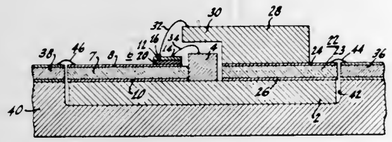
An electromechanical filter utilizing a plurality of rods mounted on a base plate parallel to each other and having

one side of each resonator flattened or coupled together by a driving rod. Input and output electromechanical transducers



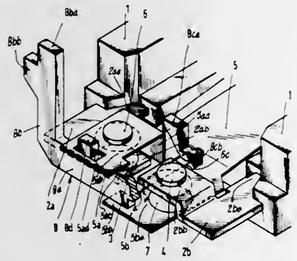
are provided and a second rod is connected to certain of said resonators to eliminate undesired frequency characteristics.

3,577,181
TRANSISTOR PACKAGE FOR MICROWAVE STRIPLINE CIRCUITS
Erwin F. Belohoubek, Kendall Park, N.J., assignor to RCA Corporation
Filed Feb. 13, 1969, Ser. No. 799,019
Int. Cl. H01p *3/08*
U.S. Cl. 333—84 **3 Claims**



Package for mounting a transistor in a microwave stripline circuit comprising a metal base member, means disposed on the base member for grounding the emitter or base electrode of the transistor, and segments of low impedance microwave transmission lines disposed adjacent the grounding means, one of these including a ceramic core having both good dielectric and good heat conducting properties and being adapted to support the transistor and connect it to an RF output circuit. The other segment is adapted to electrically connect the transistor to an RF input circuit.

3,577,182
SWITCH-OVER CONTACT ARRANGEMENT FOR POWER RELAYS
Herbert Krautwald; Helmut Moller, and Richard Siepmann, Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Feb. 17, 1969, Ser. No. 799,785
Claims priority, application Switzerland, Feb. 19, 1968, 2470/68
Int. Cl. H01h *1/12*
U.S. Cl. 335—185 **10 Claims**

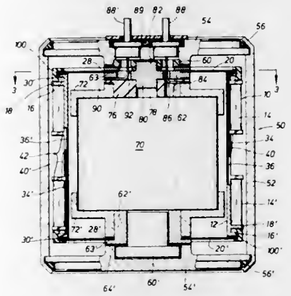


A low profile power relay contact is made possible by an assembly comprising a bifurcated contact spring having one shank bent above a level of the spring and overlapping an unbent shank whereby the bifurcated portions securely grip but do not impart rotative forces to an operating member which is moved up and down in response to movement of an armature by an electromagnetic field. A first carrier plate lies in generally the same plane as the unbent portion of the contact spring and is below the bent contact spring while a second carrier plate is bent to lie above the unbent carrier spring whereby upon movement of the operating member a contact is made and a contact is broken.

3,577,183
ELECTRICAL TEMPERATURE SENSOR
Hermann Walter Gruenling, Erlangen-Bruck, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Feb. 28, 1968, Ser. No. 708,882
Claims priority, application Germany, Mar. 25, 1967, S109022
Int. Cl. H01c *7/08*
U.S. Cl. 338—26 **4 Claims**

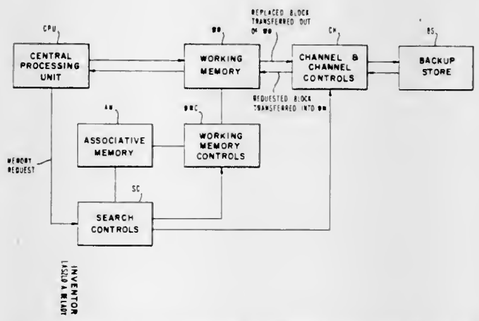
Wire of a material having electrical resistance which varies in magnitude in accordance with temperature variations is covered with glass insulation and is directly mounted on a body whose temperature is to be sensed.

3,577,184
LOW-DISTORTION SEISMOMETER
William O. McNeel, and Louis W. Erath, Houston, Tex., assignors to Geo Space Corporation
Filed Mar. 14, 1969, Ser. No. 807,186
Int. Cl. H04r *9/04*
U.S. Cl. 340—17 **9 Claims**



A compact, high-sensitivity, low-distortion, electromagnetic-type seismometer having a pair of coils forming part of a mass-coil assembly concentrically suspended in an annular airgap established by a permanent magnet. The suspension system includes a pair of spring spiders which are clampingly secured to the mass-coil assembly by a pair of insulating retainer rings to allow the springs and the mass-coil assembly freedom of relative motion when the mass-coil assembly becomes subjected to unbalanced rotational moments. The symmetry of construction assures a compact, rugged seismometer of very low distortion. Advantage is taken of the preformed stresses in the springs to assure continuous, wiping, low-resistance contacts between the current-carrying springs and the coil terminals.

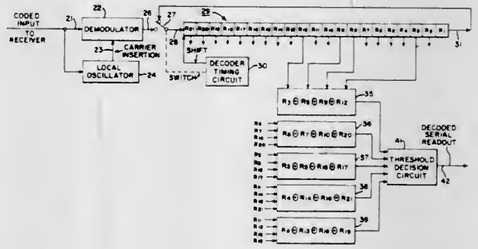
3,577,185
ON-LINE SYSTEM FOR MEASURING THE EFFICIENCY OF REPLACEMENT ALGORITHMS
Laszlo A. Belady, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 2, 1969, Ser. No. 863,265
Int. Cl. G06f *15/00*
U.S. Cl. 340—172.5 **10 Claims**



Technique for dynamically measuring the efficiency of a replacement algorithm in a virtual-memory data processing system. Each time the actual replacement algorithm effects the replacement of a "block" or "page" stored in the working memory, the measurement system automatically compares the number of such replacement that have been made with the number that would have been required by an assumed "optimal" replacement algorithm, the latter being unable to make its determinations in real time. The difference between the actual replacement count and the optimal replacement count is the number of unnecessary block transfers. The efficiency measurement functions are performed during those periods when the processor has been interrupted for a block replacement and is awaiting the entry of a newly demanded block into the working memory. Thus, the present system makes its efficiency measurements in an efficient manner. To accomplish this, the system utilizes an associative memory or equivalent storage mapping means having provisions for storing special reference bits (R′ bits) in the words respectively associated with the addresses in working memory. Each time a block stored in working memory is referenced by the processor, the R′ bit associated with that block is set. Then, when the next block replacement occurs, the measurement system is able, with the aid of these R′ bits, to update the optimal replacement pattern, or more specifically, to determine what blocks currently would have been present in the working memory if the optimal replacement algorithm had been followed and, therefore, whether the currently demanded replacement operation would have been necessary if said algorithm had been followed. The measurement system also is able to detect the occasional instances, if any, in which the actual replacement algorithm is able to avoid making a block replacement that the optimal algorithm would have found necessary. The system is further able to detect when, due to incomplete knowledge of the order of referencing, it is uncertain whether the optimal algorithm could have avoided making the currently demanded block replacement, and in such a case the system specifies a possible range of values for the replacement efficiency.

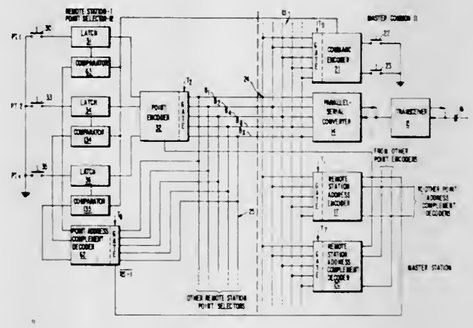
3,577,186
INVERSION-TOLERANT RANDOM ERROR CORRECTING DIGITAL DATA TRANSMISSION SYSTEM
Michael E. Mitchell, Syracuse, N.Y., assignor to General Electric Company
Filed May 28, 1969, Ser. No. 828,485
Int. Cl. G08c *25/00;* **H04l** *7/00*
U.S. Cl. 340—146.1 **4 Claims**

A digital data transmission system is disclosed which decodes received error correction coded digital signals properly, irrespective of whether or not the polarities of these signals have become inverted during transmission or reception. The system thus permits a 180° phase ambiguity in the reinsertion of a regenerated suppressed carrier or subcarrier signal in the receiver, thereby simplifying the receiver in addition to correcting errors to improve the reliability of data transmission. The disclosed decoder circuitry includes a plurality of modulo 2 adder circuits for generating a plurality of



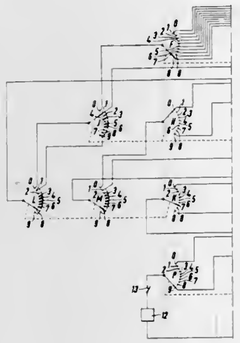
estimators each of which is the mod 2 sum of an even number of the received digits. These estimators are fed to a threshold decision circuit which provides a serial readout of the decoded digits. The threshold decision circuit may consist of a simple majority decision circuit or a multiple input threshold circuit with either equal or unequal weighting factors on its input estimators.

3,577,187
DIGITAL INFORMATION TRANSFER SYSTEM HAVING INTEGRITY CHECK
Ralph A. Benson, Peabody, Mass., assignor to General Electric Company
Filed Sept. 3, 1968, Ser. No. 756,995
Int. Cl. H04g *1/00, 3/00, 5/00*
U.S. Cl. 340—163 **14 Claims**



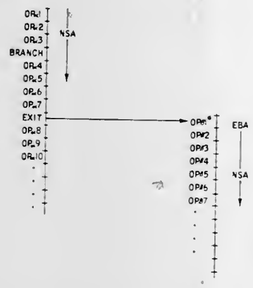
A digital information transfer system for selecting and then enabling a remote utilization device by a digital address including means for assuring system integrity. A selector is actuated to energize one comparator input and generate a unique digital address to enable one utilization device. The digital complement of the enabled utilization device address is generated and transmitted to a decoder at the selector. If the correct utilization device is enabled, the digital complement is decoded to energize the second comparator input. Simultaneous energization of two comparator inputs enables means for operating the utilization device. If a system malfunction occurs, inputs to two different comparators are energized, thereby blocking further operation.

3,577,188
COUNTER-OPERATED CONTROL SYSTEMS
John A. Thomson, and Brian R. Evill, Surrey, England, assignors to Avery-Hardoll Limited, Chessington, Surrey County, England
Filed Apr. 30, 1968, Ser. No. 725,303
Int. Cl. H04q *1/20*
U.S. Cl. 340—164 **4 Claims**



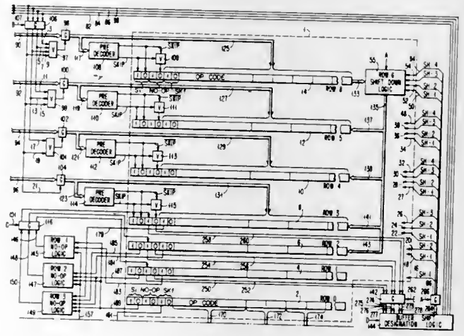
A counter-operated control system which can be set to initiate at least two control operations, one at a count which is less by a predetermined number than a selected maximum count, the other comprises a series of counters counting, for example, units, tens, hundreds etc., a separate settable unit associated with each counter and means responsive to the arrival of the counters at at least two numbers bearing different relations to the settings of the associated settable units to provide successive operation initiating signals to initiate the two control operations.

3,577,189
APPARATUS AND METHOD IN A DIGITAL COMPUTER FOR ALLOWING IMPROVED PROGRAM BRANCHING WITH BRANCH ANTICIPATION REDUCTION OF THE NUMBER OF BRANCHES, AND REDUCTION OF BRANCH DELAYS
John Cocke, Mount Kisco; Brian Randell, Pleasantville; Herbert Schorr, Briar Cliff, N.Y., and Edward H. Sussenguth, Los Altos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 15, 1969, Ser. No. 791,255
Int. Cl. G06f *9/00, 9/16*
U.S. Cl. 340—172.5 **13 Claims**



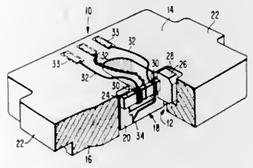
Apparatus and a method in a digital computer is disclosed for allowing improved program branching from a first instruction sequence to a second instruction sequence. Said apparatus includes means for decoding a branch instruction in said first sequence; means for determining parameters which are to enter into a condition determination, the resolution of which defines whether or not the branch is to be made, means for detecting a specific type instruction in said first sequence subsequent to said branch instruction, said specific type instruction indicative of the point in the first instruction sequence at which the branch is to be made; and means responsive to said detection for ordering instructions from said second instruction sequence to be processed subsequent to the processing of said specific type instruction.

3,577,190
APPARATUS IN A DIGITAL COMPUTER FOR ALLOWING THE SKIPPING OF PREDETERMINED INSTRUCTIONS IN A SEQUENCE OF INSTRUCTIONS, IN RESPONSE TO THE OCCURRENCE OF CERTAIN CONDITIONS
John Cocke, Menlo Park; Philip S. Dauber; Herbert Schorr, and Edward H. Sussenguth, Los Altos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 26, 1968, Ser. No. 740,360
Int. Cl. G06f *9/10*
U.S. Cl. 340—172.5 **9 Claims**



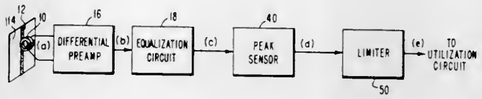
Apparatus in a digital computer for allowing the skipping of predetermined instructions in a sequence of instructions is disclosed. Means are provided for detecting a specific type of instruction in a sequence of instructions. This specific type of instruction is referred to as a skip instruction and indicates that upon the occurrence of a specified machine condition, predetermined subsequent instructions in said sequence are to be skipped. Further means are provided to determine the occurrence of the specified machine condition, and to emit an output signal indicative of the occurrence. Means responsive to the output signal effect the skipping of the predetermined instructions.

3,577,191
MAGNETIC HEAD ASSEMBLY WITH SIDEBAR
Eduard E. Haertlein, Fremont, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Aug. 5, 1968, Ser. No. 750,227
Int. Cl. G11b *5/10, 5/42*
U.S. Cl. 340—174.1F **8 Claims**



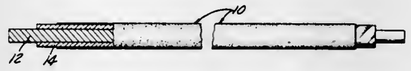
A magnetic head assembly, useful for noncontact magnetic recording, is formed to provide an inner cavity, wherein a thin magnetic core is fixed against a cavity wall. A magnetic sidebar, to which electrical coils are mounted, is secured adjacent to the core to complete the magnetic circuit.

3,577,192
REPRODUCE HEAD WITH PEAK SENSING CIRCUIT
Carl E. Schlaepfer, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Feb. 1, 1968, Ser. No. 702,265
Int. Cl. G11b *5/02*
U.S. Cl. 340—174.1H **2 Claims**



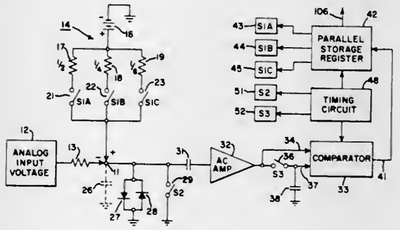
In an apparatus for reproducing a data signal recorded on a magnetic medium, a playback circuit comprising a transducer providing an electrical signal, a linear integrator coupled to said signal transducing means for detecting the peaks of the electrical signal and for developing a peak-detected signal that traverses and is equal to a reference signal level in substantially simultaneous time correspondence with said peak; and a wave shaper for producing a digital waveform having transitions in simultaneous time correspondence with said peaks.

3,577,193
THERMAL CELL
Irving J. Hutkin, San Diego, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.
Division of Ser. No. 475,022, July 26, 1965, Pat. No. 3,416,971.
Filed Mar. 22, 1968, Ser. No. 737,266
Int. Cl. G08b *17/06;* **H01c** *7/00;* **H01v** *1/14*
U.S. Cl. 340—228 **2 Claims**



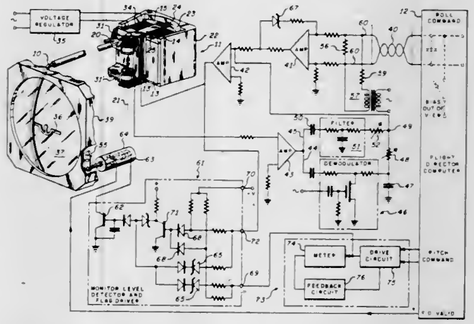
An improved device in the form of a web for detecting fires and other high temperature conditions comprises a conductive ring with a number of filamentary thermal cells mounted thereon, each cell including a core comprising stainless steel with a glass coating of specific composition disposed on the core and ionically conductive at a certain temperature. A sheath of metal, such as silver, dissimilar to the core metal is disposed on the glass coating. A lattice form of a spaced plurality of intersection cells connected at opposite ends to the ring and interwoven with one another at the intersections is provided.

3,577,194
ANALOG TO DIGITAL CONVERSION CIRCUIT
Donald L. Beall, Syracuse, N.Y., assignor to General Electric Company
Filed Jan. 3, 1969, Ser. No. 788,867
Int. Cl. H03k *13/02*
U.S. Cl. 340—347AD **4 Claims**



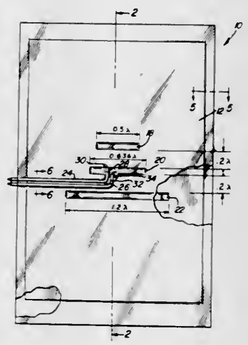
An analog-to-digital conversion circuit is disclosed, which converts a varying analog signal to the nearest available digital value by the successive approximation technique. The circuit includes a summing mode for the analog and various digital voltages, followed by a chopper switch, AC amplifier, sample-and-hold circuit, voltage comparator, and digital approximation control circuits. The advantageous results are high speed, excellent resolution and accuracy, and low drift characteristics.

3,577,195
SERVOED METER APPARATUS
Charles E. Clift, Phoenix, Ariz., assignor to Sperry Rand Corporation
Filed Apr. 14, 1969, Ser. No. 815,933
Int. Cl. G01r *17/06*
U.S. Cl. 343—108 **13 Claims**



Apparatus for positioning an indicator in accordance with a control signal including a D'Arsonval-type meter movement having an auxiliary AC excitation winding on the field magnet thereby providing both a unidirectional and an alternating flux field for the meter movement magnetic circuit. The meter armature has two windings, one being excited by a control signal and reacting with the unidirectional field to displace the armature and the other operating to sense both the displacement of the armature and the rate of change of said displacement by reacting respectively with the alternating and unidirectional fields. When included in a closed-loop servosystem the meter movement operates as both a servodrive and an angular motion transducer providing displacement and rate feedback terms.

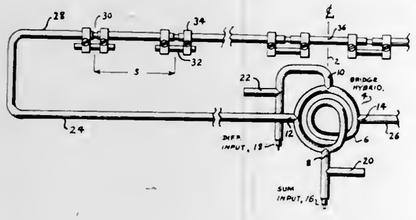
3,577,196
ROLLABLE SLOT ANTENNA
Eugene F. Pereda, 460 Electric Ave., Seal Beach, Calif.
Filed Nov. 25, 1968, Ser. No. 778,487
Int. Cl. H01q *13/10*
U.S. Cl. 343—770 **5 Claims**



An antenna having a rectangular sheet of metal foil with parallel spaced slots formed therein. The slotted sheet serves as a radiator operating in the UHF band. The metal sheet is enclosed between overlying and underlying plastic sheets

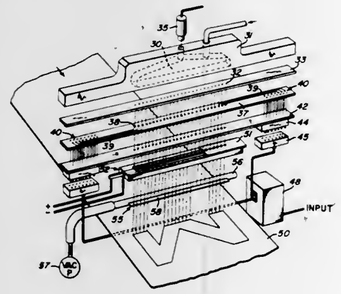
which are heat sealed to the metal sheet. The composite laminate structure is flexible thus permitting the rolling thereof.

3,577,197
SLOTTED CABLE LOCALIZER ANTENNA
Chester B. Watts, Jr., 6505 Pinecrest Court, Annandale, Va.
Filed Sept. 4, 1969, Ser. No. 855,142
Int. Cl. H01q *13/10*
U.S. Cl. 343—771 **4 Claims**



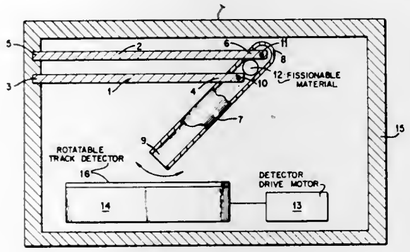
This invention relates to antennas for simultaneous transmission of sum and difference patterns as in a runway localizer for instrument landing of airplanes. A straight horizontal run of coaxial cable, placed centrally perpendicular to the extension of the runway centerline, is symmetrically fed from both ends by an RF bridge in sum and difference modes. The outer conductor of the cable is periodically interrupted by slots which permit currents to flow on the outside of the outer conductor. The antenna current distributions corresponding to the two modes are controlled by low-resistance shunts placed across the slots and by the relationship between the slots spacing and the internal guide-wavelength. To maintain the relationship over the 4 percent band of localizer frequencies, the guide-wavelength is adjusted always to the same value by filling the cable with the necessary quantity of a gas of relatively high-dielectric constant.

3,577,198
CHARGED DROP GENERATOR WITH GUARD SYSTEM
Dale R. Beam, Chillicothe, Ohio, assignor to The Mead Corporation, Montgomery County, Ohio
Continuation-in-part of application Ser. No. 782,048, Dec. 9, 1968, now abandoned. This application Nov. 24, 1969, Ser. No. 879,131
Int. Cl. G01d *15/18*
U.S. Cl. 346—75 **1 Claim**



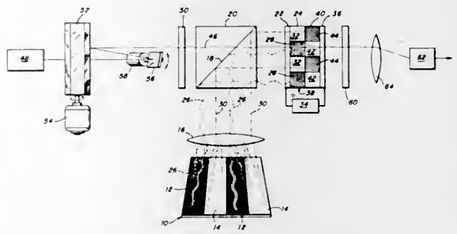
In apparatus for selectively charging of individual drops in a liquid stream or fluid filament divided into drops, a grounded guard electrode surrounds the stream between a charging electrode and a set of electrodes which create a deflection field. This isolates the fluid filament tip from the deflecting electrodes and avoids induced charges on it from the deflection field.

3,577,199
MEASURING IRRADIATION-INDUCED DEFORMATIONS OF MATERIALS
Warner W. Schultz, Schenectady, N.Y., assignor to the United States of America as represented by the United States Atomic Energy Commission
Filed Aug. 22, 1969, Ser. No. 852,360
Int. Cl. G01t *3/00, 5/00*
U.S. Cl. 250—83.1 **8 Claims**



This invention relates to a method and apparatus for measuring irradiation-induced change in length of a test sample. Neutron irradiation produces a differential change in length between the lengths of a test sample and a comparison standard. Mechanical pivot means are provided for magnifying the differential change in length. Means including a source of fissionable material and a track detector surface are provided for recording the magnified differential change in length.

3,577,200
REAL-TIME SOLID STATE CAMERA SYSTEM
Ralph E. Aldrich, Arlington, and Paul J. Caruso, Bedford, Mass., assignors to Itek Corporation, Lexington, Mass.
Filed Sept. 12, 1968, Ser. No. 759,360
Int. Cl. H04n *3/10*
U.S. Cl. 178—7.1 **13 Claims**

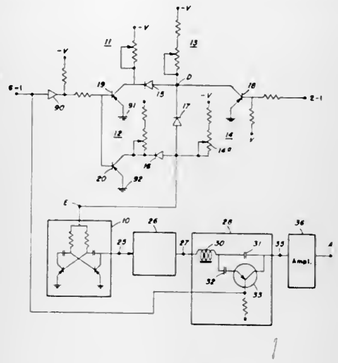


Camera apparatus is disclosed for sensing the pattern of modulation imposed by an electro-optic medium on radiation as a function of the electric field established across the electro-optic medium by the effect of a radiant image projected on a photoconductor medium associated with the electro-optic medium across which mediums an electric field has been established.

3,577,201
PORTABLE COMPUTER TERMINAL
Jesse T. Quatse, Pittsburgh, Pa., and Brook Dixon, Seldon, N.Y., assignors to Vernitron Corporation, Farmingdale, N.Y.
Filed Jan. 8, 1968, Ser. No. 696,174
Int. Cl. H04m *11/06*
U.S. Cl. 179—2DP **5 Claims**

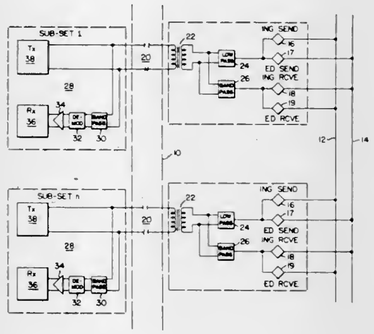
The invention is concerned with a logic decoder means which senses a signal indicative of whether a teletype machine or a computer originates a communicative line between a portable computer terminal and the computer. The modulator and demodulator within the portable terminal computer operate in different frequency bands and have

filter networks adapted to be switched into circuit with the information signals, in response to output signals from the



logic decoder and thereby set the respective frequency bands in the modulator and demodulator.

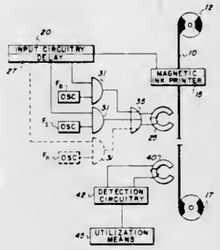
3,577,202
TELEPHONE HYBRID ARRANGEMENT WITH FREQUENCY SEPARATION FOR USE WITH TDM SYSTEMS
Barrie Brightman, Webster, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.
Filed July 6, 1967, Ser. No. 651,568
Int. Cl. H04j *1/06*
U.S. Cl. 179—15A **6 Claims**



A telephone hybrid system for use with a TDM switching center including filter arrangements at the center and at the subscriber subsets, which serve as hybrid circuits to establish directivity of signalling. A carrier signal at the frequency of the TDM frame rate and derived from the TDM system is used to transmit signals from the switching center to the subsets, thus enabling directional separation by simple filtering.

3,577,203
CHARACTER RECORDING AND RECOGNITION SYSTEM
Kenneth M. Beach, Jr., Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Apr. 18, 1968, Ser. No. 722,293
Int. Cl. G06k *7/08, 9/18*
U.S. Cl. 235—61.11 **7 Claims**

A system for automatically reading alphanumeric characters recorded on a document wherein the symbols are shaped so as to be also recognizable by human beings. The apparatus comprises a transport for advancing a document strip past a plurality of stations which include a marking station at which magnetic material is applied as alphanumeric characters in response to discrete signals, a recording station at which flux patterns associated with the characters are impressed in superposed relationship therewith in response to frequency signals, and frequency signals in timed relation to the move-

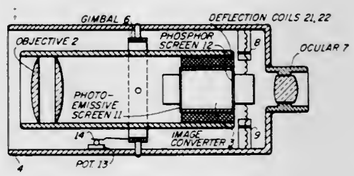


ment of the document. The magnetic material may have an electrostatic component to enable electrostatic recording or may comprise magnetic particles in solid or liquid form. A detection circuit is provided for reading out the character frequency patterns and supplying this information in signal form to a utility device.

3,577,204
NOVEL PHOTOGRAPHIC PROCESS OF DIFFUSION TRANSFER OF X-RAY IMAGE WITH PHOSPHORESCENT LUMINOPHOR
Joel M. Peisach, Hudson, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
No drawing. Filed Mar. 17, 1967, Ser. No. 623,990
Int. Cl. G01n *21/34*
U.S. Cl. 250—65 **6 Claims**

X-ray exposures may be reduced by using a film containing an integral X-ray intensifier screen composed of phosphorescent luminophors, and intensifying the latent image by actinic radiation emitted after the X-ray exposure has ceased. The thus exposed and intensified film is diffusion transfer processed to provide a silver transfer image.

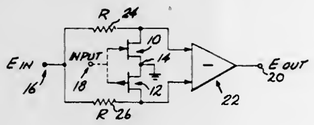
3,577,205
AUTOMATIC IMAGE MOTION STABILIZATION SYSTEM
Gilbert L. Hobrough, Woburn, Mass., assignor to Itek Corporation, Lexington, Mass.
Filed Nov. 19, 1965, Ser. No. 508,779
Int. Cl. H01j *31/50*
U.S. Cl. 250—213 **5 Claims**



An image motion stabilization system for use with telescopes, cameras, and the like. An inner casing containing an objective lens and an image converter is mounted within an outer support casing so as to be movable with respect thereto. Displacement of the outer casing with respect to the

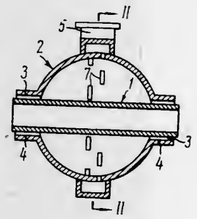
inner casing caused by vibration or movement produces a corresponding displacement of the electron stream in the image converter such that a stable image of a scene viewed by the objective lens will be presented to an ocular in the outer casing.

3,577,206
COMPLEMENTARY FIELD-EFFECT TRANSISTOR MIXER
Philip J. Ferrell, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Apr. 28, 1969, Ser. No. 819,591
Int. Cl. H03k *17/00*
U.S. Cl. 307—240 **7 Claims**



A pair of complementary field-effect transistors with common source connections are connected with a first input signal identically common to both drains and a second input signal identically common to both gates so as to give a mixed first and second signal output through a balanced subtractor connected between the drains.

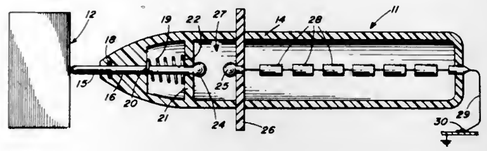
3,577,207
MICROWAVE PLASMATRON
Vladimir Pavlovich Kirjushin, ulitsa Sovetskaya 1-a, kv.5., Fryazino, U.S.S.R.
Filed May 7, 1969, Ser. No. 822,450
Int. Cl. H01j *7/46, 19/80*
U.S. Cl. 315—39 **4 Claims**



A device for producing low-temperature plasma of microwave discharge at atmospheric pressure of a plasma-forming gas suitable for conducting chemical reactions of extreme purity, depositing thin films, growing crystals, producing powders and other technological purposes. The device includes a spherical or radial waveguide wherein there is excited a converging symmetrical electromagnetic wave, and a discharge tube disposed on the axis of symmetry of the waveguide.

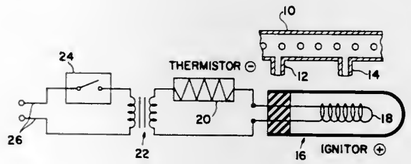
3,577,208
ELECTROSTATIC GROUNDING PROBE FOR USE IN EXPLOSIVE ATMOSPHERES
John T. Petrick, Fredericksburg, Va.
Filed July 3, 1969, Ser. No. 838,923
Int. Cl. H01r *3/06;* **H05f**
U.S. Cl. 317—2R **6 Claims**

A grounding probe having a stationary contact connected to ground through a high resistance. A movable contact is normally biased away from the stationary contact but can be moved adjacent the stationary contact by pressing it against the object to be grounded. The area where stationary and



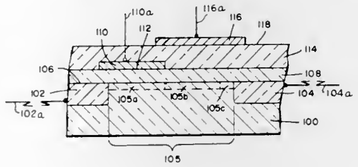
movable contacts come together is enclosed so that any spark is isolated from the atmosphere.

3,577,209
ELECTRIC IGNITION SYSTEM
Charles H. Perkins, Richmond, Va., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Feb. 28, 1969, Ser. No. 803,297
Int. Cl. F23g *7/10*
U.S. Cl. 317—98 **4 Claims**



An electric ignition system utilizing an electric ignitor having a positive temperature coefficient of resistance and a negative temperature coefficient resistor coupled in series therewith to provide a constant resistance series network.

3,577,210
SOLID-STATE STORAGE DEVICE
Hans G. Dill, Costa Mesa, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Feb. 17, 1969, Ser. No. 799,817
Int. Cl. H01l *11/00, 11/14*
U.S. Cl. 317—235 **30 Claims**



A solid-state storage device in the form of an insulated gate field effect tetrode. A depletion region is created in the channel so that an electric field emanating from one gate can penetrate the channel and attract high energy charge carriers into traps in the insulator. The charge carriers enter the insulator by surmounting the Schottky barrier at the semiconductor-insulator interface.

CHEMICAL

3,577,211
STABILIZATION OF POLYESTERS
Warren K. Wilson, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Filed May 22, 1967, Ser. No. 640,403
Int. Cl. D06m *13/12, 13/16*
U.S. Cl. 8—115.5 **3 Claims**

This invention relates to the process in which an organic polymeric structure is treated with a polyacid chloride and then with a reactive ultraviolet light stabilizer to form a structure having a chemically bonded stabilizer.

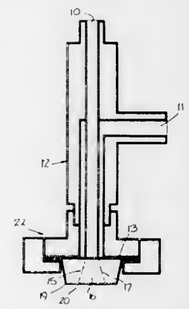
3,577,212
PROCESS FOR THE MODIFICATION OF POLYAMIDE FIBERS
Marcel Georges Jirou, Sotteville les Rouen, and Pierre Charles Victor Bouvet, Petit-Quevilly, France, assignors to Ugine Kuhlmann, Paris, France
No Drawing. Filed Aug. 7, 1967, Ser. No. 658,613
Claims priority, application France, Aug. 8, 1966, 72,363
Int. Cl. D06p *3/34*
U.S. Cl. 8—115.5 **7 Claims**

Process for the modification of synthetic polyamide fibers which comprises treating the fibers at a pH of from 3 to 11 inclusive and at a temperature of from 40° C. to the boiling temperature of the bath with a compound of the formula:

$$A_1-SO_2-\underset{\underset{R}{|}}{N}-W \qquad (I)$$

in which A_1 represents a non-colouring, aliphatic, aromatic or heterocyclic radical, W represents the residue of an acylating agent carrying an atom or group of atoms capable of reacting with the polyamide fibers, and R represents a hydrogen atom or an alkyl group having 1 to 4 carbon atoms, the amount of compound (I) used being between 0.1% and 20% by weight of the polyamide fibers. The treated fibers have different properties from untreated polyamide fibers and in particular their affinity for acid dyestuffs is reduced or rendered practically nil.

3,577,213
FIBER PRODUCT AND PROCESS
William J. Myles, Charlotte, N.C., and Roland K. Kunkel, Berkeley Heights, N.J., assignors to Celanese Corporation, New York, N.Y.
Original application Jan. 4, 1965, Ser. No. 423,137. Divided and this application July 12, 1968, Ser. No. 758,174
Int. Cl. D06m *1/100*
U.S. Cl. 8—130 **3 Claims**



A process comprising preparing filaments each of which contains at least two segments in eccentric relationship in its cross-section all along its length, one of said segments being a saponifiable cellulose ester containing quaternary ammonium salt dispersed throughout its interior and the other segment being a cellulose ester free of quaternary ammonium salts.

3,577,214
PROCESS FOR CLEANING FABRICS
Ambrose E. Le Van, Short Hills, N.J., and David Tatum, Swarthmore, Pa., assignors to Ametek, Inc., New York, N.Y.
Filed Oct. 19, 1967, Ser. No. 676,503
Int. Cl. B08b *7/04*
U.S. Cl. 8—137 **9 Claims**

A process for cleaning soiled fabrics which utilizes an apparently dry cleaning medium comprising a finely particulate carrier adsorbed with a cleaning liquid. The soiled fabric is placed into a plenum containing the cleaning medium and the medium is fluidized by directing an air stream through the plenum. Differential motion is applied by transducer means to the particulates of the medium while the fabric is in the plenum. The foreign material carried by the fabric is transferred to the cleaning medium due to the scouring action of the medium. The apparatus for the process comprises an enclosure having within it the mentioned plenum, means for retaining the soiled fabric within the plenum and means for directing an air stream through the cleaning medium to fluidize the cleaning medium and thereafter to recirculate the air stream. Transducer means applies a differential motion to the particulates to aid in the cleaning action.

3,577,215
DRY CLEANING PROCESS
Ector P. Impullitti, Detroit, Mich., assignor to F. W. Means & Company, Chicago, Ill.
Filed Feb. 3, 1969, Ser. No. 796,069
Int. Cl. D06l *1/02*
U.S. Cl. 8—142 **10 Claims**

Oil impregnated textile cleaning utensils can be cleaned and prepared for reuse in a single brief operation by using a petroleum mineral oil as the cleaning medium. The utensils are cleaned by placing them into the wheel of a commercial dry cleaning apparatus then adding an excess of oil beyond that necessary to saturate the utensils at a temperature between 60–250° F. and agitating the wheel for about 15 minutes. The oil is drained off and the utensils are spun to remove excess oil but leave about 20 to 40 wt. percent oil in the utensil based on the weight of the clean, dry utensil or implement.

3,577,216
PROCESS FOR THE RECOVERY OF SELENIUM IV UTILIZED AS A CATALYST FOR OXIDATION REACTIONS
Francis Weiss and Andre Lakodey, Pierre-Benite, Rhone, France, assignors to Ugine Kuhlmann, Paris, France
No Drawing. Filed Nov. 24, 1967, Ser. No. 685,282
Claims priority, application France, Nov. 29, 1966, 85,385
Int. Cl. C01b *19/00*
U.S. Cl. 23—50 **11 Claims**

A process for the recovery of selenium IV which has been used as a catalyst in the oxidation of organic compounds by oxygen, hydrogen peroxide, or organic peroxides which comprises precipitating a metal selenite from the reaction environment or medium at the end of the

oxidation process, separating the precipitated metal selenite from the medium and extracting therefrom selenious acid or anhydride which may be recycled.

3,577,217
PROCESS FOR RECOVERING A CHROMATE AND CUPRIC OXIDE BY DECOMPOSITION OF A CATALYST OR WASTE CATALYST OF COPPER CHROMITE

Takuo Machida, Takarazuka-shi, and Masataka Nakagawa, Yamato-Takada-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Sept. 30, 1968, Ser. No. 763,984
Int. Cl. C01g *37/14, 3/02*
U.S. Cl. 23—56 **2 Claims**

A process is provided for recovering a chromate and cupric oxide by decomposition of a catalyst or waste catalyst of copper chromite mainly represented by the formula

$$CuO \cdot CuCr_2O_4$$

which comprises the steps of

(a) mixing said catalyst or waste catalyst with an alkali metal compound of the formula

$$(M)_n(B)_m$$

wherein

M is an alkali metal selected from sodium and potassium;

B is an oxygen atom, a carbonic radical, a bicarbonic radical or a hydroxy radical; and

each *m* and *n* is either 1 or 2, dependent upon the respective valences of M and B;

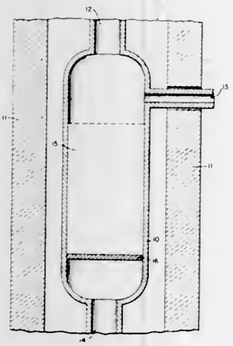
(b) heating the resultant mixture of (a) at a temperature of from 300° C. to 1200° C. in the presence of oxygen or a molecular oxygen-containing gas; and

(c) mixing the resultant mixture of (b) with water to recover cupric oxide as an insoluble solid and a chromic acid salt of said alkali metal as an aqueous solution.

3,577,218
METHOD FOR THE PRODUCTION OF HYDROGEN CYANIDE WHEREIN PLATINIZED MULLITE SERVES AS A CATALYST

Patrick M. Brown, Catonsville, and Heyman C. Duecker, Rockville, Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Aug. 28, 1968, Ser. No. 755,938
Int. Cl. C01c *3/02;* **B01j** *9/04*
U.S. Cl. 23—151 **3 Claims**



A mixture of ammonia and methane is reacted over platinized mullite catalyst to give high yields of hydrogen cyanide. The catalyst is prepared by depositing platinum on either natural or synthetic mullite; it possesses improved stability and avoids the problem of carbonitridation frequently encountered in use of alumina as a catalyst support in the production of hydrogen cyanide.

3,577,219
RECOVERY OF SULFUR DIOXIDE FROM WASTE GASES

Indravadan S. Shah, Forest Hills, N.Y., assignor to Chemical Construction Corporation, New York, N.Y.

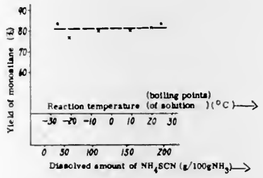
Filed Nov. 1, 1968, Ser. No. 772,547
Int. Cl. C01b *17/72;* **C01f** *5/42*
U.S. Cl. 23—168 **12 Claims**

A process is provided to efficiently and economically absorb and recover sulfur dioxide from a waste gas stream such as the tail gas from a sulfuric acid facility, or flue gas from the combustion of a sulfur-containing fuel. The process thus eliminates air pollution, and produces a useful sulfur-containing product from the recovered sulfur dioxide. The waste gas stream is scrubbed with a recirculating aqueous slurry containing magnesium oxide and magnesium sulfite. A small quantity of magnesium sulfate may be present if formed as a result of oxidation of magnesium sulfite or absorption of sulfur trioxide.

3,577,220
PROCESS FOR PRODUCTION OF MONOSILANE (SiH_4) AND GERMANIUM HYDRIDE (GeH_4)

Tatsuo Kuratomi, 4–2–18 Hamatake, Chigasaki, and Yoshifumi Yatsurugi, 6–507, 7–2-chome, Tsujido Nishikaigan, Fujisawa, both of Kanagawa, Japan

Filed Oct. 29, 1968, Ser. No. 771,405
Claims priority, application Japan, Oct. 31, 1967, 42/69,592
Int. Cl. C01b *33/04;* **C22b** *41/00*
U.S. Cl. 23—204 **9 Claims**



A process for producing monosilane (SiH_4) comprising reacting magnesium silicide with a concentration of ammonium thiocyanate in liquid ammonia at ambient temperature and pressure. Also, a process for producing germanium hydride (GeH_4) comprising reacting magnesium germanide with a concentration of ammonium thiocyanate in liquid ammonia at ambient temperature and pressure.

3,577,221
HYDROGEN MANUFACTURE

Calvin S. Smith and William J. McLeod, El Cerrito, Calif., assignors to Chevron Research Company, San Francisco, Calif.

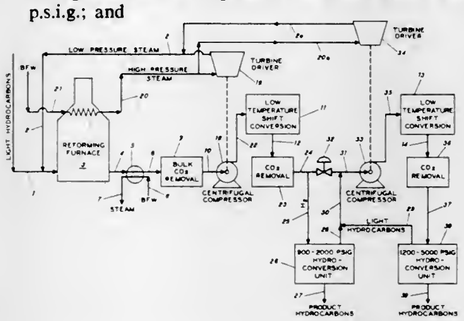
Continuation-in-part of application Ser. No. 736,520, May 17, 1968, which is a continuation-in-part of abandoned application Ser. No. 665,106, Sept. 1, 1967. This application Dec. 31, 1968, Ser. No. 788,300
Int. Cl. C01b *1/02, 1/18*
U.S. Cl. 23—213 **7 Claims**

According to the present invention a process is provided for producing high pressure hydrogen which comprises:

(a) generating a hydrogen-rich gas stream containing CO and CO_2;

(b) removing CO_2 from the hydrogen-rich gas stream to obtain a CO_2 lean, hydrogen-rich gas stream;

(c) centrifugally compressing the CO_2-lean, hydrogen-rich gas stream to a pressure of above about 400 p.s.i.g.; and



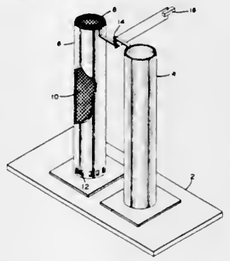
(d) reacting CO contained in the CO_2-lean, hydrogen-rich gas stream with H_2O at a pressure of above about 400 p.s.i.g.

Preferably CO_2 is removed from the hydrogen obtained after step (d) and the purified compressed hydrogen is used in a hydroconversion process.

3,577,222
CARBON MONOXIDE DETECTOR

John M. Ward, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Nov. 15, 1968, Ser. No. 776,011
Int. Cl. G01n *31/10*
U.S. Cl. 23—254 **3 Claims**



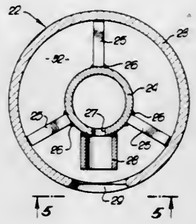
The carbon monoxide detector comprises two parallel mounted cylinders of metal having a high coefficient of linear expansion and spaced apart from one another on a common base. A chemical catalyst of the type capable of generating heat when exposed to a minimal concentration of carbon monoxide is mounted within a porous tube placed within one of the cylinders. Free air is allowed to enter the catalyst containing cylinder from its base and circulate about the catalyst. The heat generated by the catalytic reaction of carbon monoxide in air will cause the linear expansion of the cylinder thereby closing the microswitching mechanism mounted partly at the top of each cylinder. By using two cylinders having a high coefficient of linear expansion, changes in ambient temperature may be compensated for.

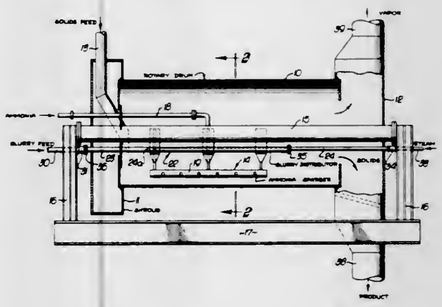
3,577,223
SLURRY DISTRIBUTOR

Alan Longacre, Whittier, Calif., assignor to Fluor Corporation, Los Angeles, Calif.

Filed Aug. 11, 1969, Ser. No. 849,096
Int. Cl. B01j *2/12*
U.S. Cl. 23—259.1 **10 Claims**

Partially ammoniated phosphoric acid slurry is distributed onto a bed of ammonium phosphate granules by a tubular distributor comprising concentric pipes spaced to provide a passage for the slurry which is



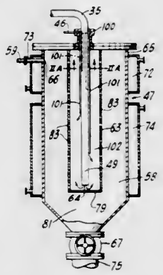


aspirated by steam discharged from the inner pipe through nozzles spaced from and alined with countersunk openings in the outer pipe.

3,577,224
APPARATUS FOR PRODUCTION OF HIGH PRESSURE POLYETHYLENE

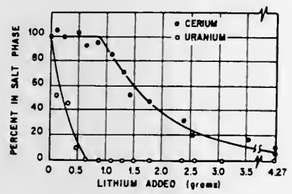
Martin Hess, Pittsburgh, and Lawrence Saroff, Carnegie, Pa., assignors to Sinclair-Koppers Company

Filed Sept. 9, 1968, Ser. No. 758,315
Int. Cl. B01j *9/08;* **C08f** *1/60, 3/04*
U.S. Cl. 23—285 **3 Claims**



An improved method and apparatus is provided for production of high pressure polyethylene in a sparger tube reactor. Cold ethylene gas is radially injected into the polymerization zone in variable amounts at spaced increments. Catalyst-rich gas is also injected into the polymerization zone at spaced increments in variable amounts with respect to the cold ethylene gas injection. Injection of both cold ethylene gas and catalyst-rich gas, at spaced increments and in various amounts with respect to each other provides control of reaction and, therefore, of temperature profile. Thus, an essentially constant temperature and pressure profile can be maintained throughout the polymerization zone.

3,577,225
METHOD FOR SEPARATING URANIUM, PROTACTINIUM, AND RARE EARTH FISSION PRODUCTS FROM SPENT MOLTEN FLUORIDE SALT REACTOR FUELS
James H. Shaffer, Oak Ridge, David M. Moulton, Knoxville, and Warren R. Grimes, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission
Continuation-in-part of application Ser. No. 745,837, July 18, 1968. This application May 15, 1969, Ser. No. 824,944
The portion of the term of the patent subsequent to Oct. 21, 1986, has been disclaimed
Int. Cl. C22b *61/04*
U.S. Cl. 23—325 **5 Claims**



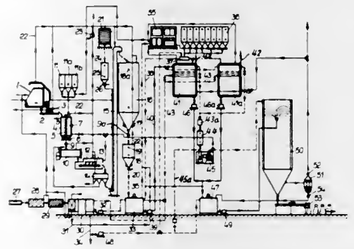
A method for reprocessing spent molten metallic fluoride salt mixtures suitable as molten salt breeder reactor fuels is provided whereby uranium and bred-in protactinium values as well as certain fission products of the lanthanide series are selectively and consecutively extracted from the salt phase into an immiscible molten bismuth solution by controlling the reduction potential between the metal and salt phases. Uranium values, which are extracted first, are oxidized and transferred from the bismuth solution into a barren salt mixture for ultimate recycle to the reactor prior to extracting the contaminants. The protactinium values are then extracted at a slightly higher reduction potential into the bismuth solution, oxidized, and transferred to a molten salt outside the reactor enviroment to await decay of the protactinium-233 to uranium-233. Finally, the lanthanide elements are extracted at a yet higher reduction potential into the bismuth solution, oxidized, and transferred to a separate salt mixture for their recovery or disposal.

3,577,226
METAL BODIES OF UNIFORM POROSITY
Raymond J. Elbert, Middleburg Heights, and Ernest G. Farrier, Parma, Ohio, assignors to Union Carbide Corporation, New York, N.Y.
No Drawing. Application June 30, 1967, Ser. No. 650,250, now Patent No. 3,433,632, dated Mar. 18, 1969, which is a continuation-in-part of application Ser. No. 484,123, Aug. 31, 1965. Divided and this application Feb. 10, 1969, Ser. No. 798,142
Int. Cl. B22f *1/00*
U.S. Cl. 29—182 **2 Claims**
Sintered porous metal sheet, having not more than about one pore per twenty-five (25) square feet of sheet with a size larger than three times the average pore size of said sheet.

3,577,227
TUNGSTEN MATERIALS AND A METHOD FOR PROVIDING SUCH MATERIALS
Gail F. Davies, Mentor, Ohio, assignor to the United States of America as represented by the Secretary of the Navy
No Drawing. Filed Oct. 4, 1968, Ser. No. 766,038
Int. Cl. C22c *15/00*
U.S. Cl. 29—182 **2 Claims**
A method for shaping and forming metallic tungsten by coating tungsten particles with a minor amount of metallic rhenium and thereafter compacting and partially sintering said coated particles. A method for providing intricate shapes of high temperature resistant, non-ductile tungsten by re-sintering said compacted and sintered rhenium coated tungsten particles at a temperature sufficient to diffuse the metallic rhenium into the tungsten. A ductile, readily formable tungsten mass and a non-ductile, highly temperature resistant, tungsten mass provided by the foregoing methods.

3,577,228
SMOKE SUPPRESSANT FUEL MIXTURE
Charanjit Rai, Somerset, Sherman D. Collins, Edison, and Elmer J. Badin, Hightstown, N.J., assignors to Cities Service Oil Company, Tulsa, Okla.
No Drawing. Filed Jan. 3, 1969, Ser. No. 788,922
Int. Cl. C10l *1/18, 1/26*
U.S. Cl. 44—76 **25 Claims**
A liquid fuel mixture having reduced soot and smoking characteristics comprises a major portion of a hydrocarbon fuel and a minor portion of a Group II–A metal organyl orthophosphate. Preferably, a barium salt of a dialkyl orthophosphoric acid is employed in amounts from about 0.1 to 2% by weight. Further improvement results when an ether, particularly a glycol ether, is additionally incorporated into the orthophosphate and fuel mixture.

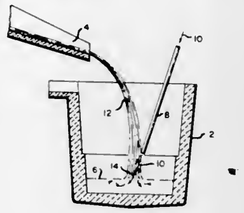
3,577,229
METHOD AND APPARATUS FOR MAKING FERTILIZER
Hans-Erwin Brück, 16 Gartenfeldstr., 55 Trier, Germany
Filed Dec. 26, 1968, Ser. No. 786,984
Claims priority, application Germany, Feb. 23, 1968, P 16 67 788.6
Int. Cl. C05f *7/00*
U.S. Cl. 71—9 **15 Claims**



In producing a spreadable grain size fertilizer from a mixture of garbage and fecal matter the garbage is treated to place it in a relatively small grain size after any metallic and fibrous materials have been removed, and the fecal matter, such as in a sewage system, is treated to remove solids, fats and detergents. The treated garbage and fecal matter is mixed as a sludge and is biologically fermented after which water is added to the fermented sludge. After a drying and granulating operation, the fermented sludge is bagged for use as a fertilizer.

3,577,230
PROCESS OF APPLYING NOVEL ALGICIDES
Edward Helmut Sheers, Flushing, N.Y., assignor to Arizona Chemical Company, New York, N.Y.
No Drawing. Filed Oct. 18, 1968, Ser. No. 768,919
Int. Cl. A01n *9/26*
U.S. Cl. 71—67 **3 Claims**
A method for destroying or inhibiting microorganisms by contacting them with a trans-hydroxy-stilbene derivative, and a composition comprising said stilbene.

3,577,231
PROCESS FOR PREPARING METAL SULFIDES
Marvin Pesses, Youngstown, Ohio, assignor to Mercer Alloys Corporation
Filed Aug. 23, 1968, Ser. No. 754,811
Int. Cl. C01g *3/12, 51/00, 53/00*
U.S. Cl. 75—1 **4 Claims**



A process for producing a concentrate of metallic sulfides (especially nickel sulfide, copper sulfide and cobalt sulfide) from metallic scrap materials. The scrap materials are melted under a reducing atmosphere and injected with sulfur-bearing material during the pouring of the molten material from the melting furnace to a ladle. Thereafter, the molten mixture of sulfides is rapidly cooled and subdivided to produce a homogeneous, friable, synthetic ore.

3,577,232
REMOVING NICKEL FROM CADMIUM
John A. Ruppert, Edgewood Farms, Ellicott City, Md. 21042, and Dominic Montagna, 6144 31st St. NW., Washington, D.C. 20015
No Drawing. Filed May 29, 1969, Ser. No. 829,092
Int. Cl. C22b *9/10, 17/00, 23/00*
U.S. Cl. 75—71 **10 Claims**
A molten halide flux is formed on top of a metallic melt of nickel-contaminated cadmium. Phosphorus is then added to the flux, and the phosphorus ingests into the metallic melt through the flux-metal interface to react with the nickel so as to form insoluble nickel-phosphorus compounds which are then removed from the molten cadmium.

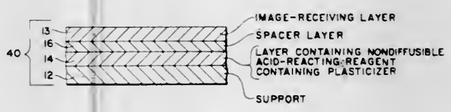
3,577,233
HIGH TEMPERATURE BRAZING ALLOYS
Nicholas T. Gamer, Palo Alto, Calif., assignor to Western Gold & Platinum Company
No Drawing. Filed Sept. 10, 1968, Ser. No. 758,705
Int. Cl. C22c *5/00*
U.S. Cl. 75—134 **11 Claims**
Brazing alloys comprising in percent by weight 25–70% gold, 5–30% palladium, 15–40% nickel, 4–12% chromium and .01 to 2% yttrium. These alloys exhibit substantial ductility and high oxidation and corrosion resistance at service temperatures of 1600–1800° F. and above continuously for 100 hours or more and therefore having particular utility in joining stainless steel and superalloys in aircraft and space craft engines and components. The addition of up to about 2% by weight of tungsten, tantalum or molybdenum to these alloys further improves their high temperature strength.

3,577,234
BRAZING ALLOYS
John D. Boughton, Philip M. Roberts, and Meczyslaw Herman Sloboda, London, England, assignors to Johnson, Matthey & Co. Limited, London, England
No Drawing. Filed Aug. 4, 1967, Ser. No. 658,350
Claims priority, application Great Britain, Aug. 18, 1966, 37,053/66
Int. Cl. C22c *9/06;* **B32b** *15/20*
U.S. Cl. 75—159 **4 Claims**
This invention relates to a brazing alloy suitable for the fluxless brazing of steels (unalloyed and alloy steels including stainless steel). The brazing alloy consists essentially of 0.5–10% nickel, 0.01–0.05% boron and the balance copper.

3,577,235
ELECTROPHOTOGRAPHIC COMPOSITION AND ELEMENT
Lawrence E. Contois, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 754,499, Aug. 21, 1968. This application Feb. 17, 1969, Ser. No. 799,917
Int. Cl. G03g *5/08, 5/06*
U.S. Cl. 96—1.6 **10 Claims**
4-aminobenzo[b]pyrylium and 4 - aminobenzo[b]thiapyrylium salts are sensitizers for organo-metallic photoconductors. Photoconductive compositions sensitized with these compounds have increased electrophotographic speed and are sensitive in the ultraviolet region of the spectrum.

3,577,236
COLOR DIFFUSION TRANSFER PROCESSES AND ELEMENTS COMPRISING AUXILIARY DEVELOPERS OR THEIR PRECURSORS
Delbert D. Fix, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Sept. 29, 1969, Ser. No. 861,997
Int. Cl. G03c *7/00, 5/30*
U.S. Cl. 96—3 **28 Claims**
Improved minimum print densities are produced in color diffusion transfer systems by processing in the presence of a lactone derivative silver halide developing agent, such as a coumarin derivative, which has the property of forming a lactone developing agent precursor under acid, neutral and slightly alkaline conditions.

3,577,237
DIFFUSION TRANSFER PHOTOGRAPHIC PRODUCTS AND PROCESSES COMPRISING ACID-REACTING REAGENTS AND POLYETHER BLOCK COPOLYMERS AS PLASTICIZERS THEREFOR
Lloyd D. Taylor, Everett, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Sept. 23, 1968, Ser. No. 761,772
Int. Cl. G03c *7/00, 5/54*
U.S. Cl. 96—3 **27 Claims**



Plasticization of the layer of a diffusion transfer image-receiving sheet containing an acid-reacting reagent may be accomplished by incorporating therein a compound selected from the group consisting of block polyether compounds of the formulae:

$$-\left(RO\right)_x\left(R_1O\right)_y- \quad \text{and}$$

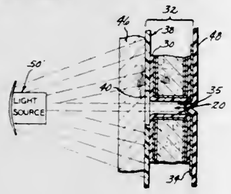
$$\begin{matrix} -\left(RO\right)_x\left(R_1O\right)_y \\ -\left(RO\right)_x\left(R_1O\right)_y \end{matrix} \diagdown NR_3N \diagup \begin{matrix} \left(RO\right)_x\left(R_1O\right)_y- \\ \left(RO\right)_x\left(R_1O\right)_y- \end{matrix}$$

where R, R_1 and R_3 are alkylene groups and x and y are integers representing the molar ratio of respective blocks. Concomitant with the plasticization effect increased temperature latitude is imparted to the system.

3,577,238
FERROCENE DYES AND PHOTOGRAPHIC ELEMENTS
Jacque K. Lindsay, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Mar. 28, 1969, Ser. No. 811,567
Int. Cl. G03c *1/64;* **G03f** *7/10*
U.S. Cl. 96—28 **9 Claims**

Light-sensitive ferrocene dyes are prepared by condensing formylferrocene or a vinylog thereof such as formylvinylferrocene with a heterocyclic reagent in an alkaline medium. The dyes so prepared are light-sensitive and operate to harden or tan gelatin upon exposure to light.

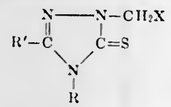
3,577,239
METHOD OF PHOTOGRAPHICALLY PRODUCING PLATED-THROUGH HOLES IN PRINTED CIRCUIT BOARDS
Matthew W. Lesnieski, Bloomingdale, N.J., assignor to Monsanto Company, St. Louis, Mo.
Filed Dec. 16, 1968, Ser. No. 783,924
Int. Cl. G03c *5/00*
U.S. Cl. 96—36.2 **4 Claims**

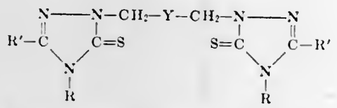


Production of plated-through holes in printed circuit cards by drilling holes at predetermined locations in a base material, plating the interior hole surfaces with a thin layer of conductive metal, coating with a layer of photoresist, vacuum-drawing portions of a flexible metal foil into the holes, and exposing the photo-resist and foil to light, whereby the photo-resist covering the interior surfaces of the holes is properly exposed.

3,577,240
DIFFUSION TRANSFER PHOTOGRAPHIC MATERIALS
Fumihiko Nishio, Odawara-shi, and Reiichi Ohi and Tatsuyo Tajima, Minamiashigara-machi, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Ashigarakami-gun, Kanagawa-ken, Japan
No Drawing. Continuation-in-part of application Ser. No. 431,453, Feb. 9, 1965. This application Oct. 24, 1968, Ser. No. 770,412
Int. Cl. G03c *7/00*
U.S. Cl. 96—52 **12 Claims**

A toning agent represented by the general formula





wherein R and R_1 each represents a hydrogen atom, a lower alkyl group or an aryl group; X represents a hydroxyl group and

(where R_1 and R_2 each represents a lower alkyl group or aryl group and R_1 and R_2 may together complete a heterocyclic ring); and Y represents

(where R_3 represents a lower alkyl group or an aralkyl group), is used in diffusion transfer photographic material to give deep black images or printings on a positive material in diffusion transfer photography.

3,577,241
METHOD OF PREPARING EDIBLE ANIMAL FEET
Ray H. Means, Omaha, and Michael Kussman and Jack Wade, Papillion, Nebr., and Victor H. Vodra, Denver, Colo., assignors to American Beef Packers, Inc., Omaha, Nebr.
No Drawing. Filed Apr. 10, 1969, Ser. No. 815,224
Int. Cl. A22c *18/00*
U.S. Cl. 99—7 **9 Claims**

A new process for preparing edible animal feet (particularly cattle and horses' feet) cleans and dehairs the feet mechanically by scalding the same in a hot caustic wash in a mechanical washing machine to remove dirt and hair from the feet; the cleaned and dehaired feet are bleached in a sodium percarbonate treatment at a lower temperature than the scald, and the resulting feet are rinsed and neutralized in non-toxic acid rinse solution.

3,577,242
ANTEMORTEM METHOD OF TENDERIZING MEAT
Edwin P. Jenevein, Jr., 7036 Town N., Dallas, Tex. 75231
No Drawing. Filed June 6, 1966, Ser. No. 555,289
Int. Cl. A22c *18/00*
U.S. Cl. 99—107 **6 Claims**

An antemortem method of tenderizing meat by administering to an animal before slaughter a collagen diminution agent (an agent which will destroy and/or inhibit collagen formation, but will not materially attack muscle cells in the subject animal), and allowing the collagen diminution agent to assimilate within the animal before it is slaughtered.

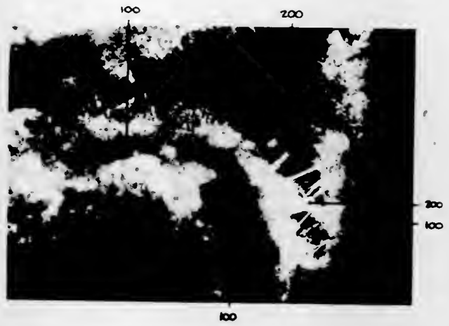
3,577,243
PROCESS OF EXTRACTING MEAT FROM CRABTAILS
Peter W. Bynagte, San Diego, Calif., assignor to Westgate-California Foods, Inc., San Diego, Calif.
No Drawing. Filed Oct. 17, 1968, Ser. No. 768,503
Int. Cl. A22c *29/00;* **A23l** *1/33*
U.S. Cl. 99—111 **5 Claims**

The process of extracting the meat from crabtails wherein the crabtails are dipped into a solution of salt water, sodium acid pyrophosphate or calcium acid pyrophosphate and sodium tripolyphosphate for a period of at least two minutes during which time the solution is agitated and then removing the meat from the crabtails and precooking the meat in boiling water.

3,577,244
PRESERVATION OF LIMESTONE STRUCTURES
Seymour Z. Lewin, New York, N.Y., assignor to New York University, New York, N.Y.
Continuation-in-part of application Ser. No. 529,213, Feb. 23, 1965. This application Dec. 19, 1968, Ser. No. 785,316
Int. Cl. C09k *3/10*
U.S. Cl. 106—12 **20 Claims**

This application is directed to a process and composition for preserving stone objects having at least 10%

calcium carbonate by maintaining the stone in contact with an aqueous solution for a sufficient period of time to



improve the weathering properties of the stone. One embodiment includes applying a solution of barium hydroxide, urea, glycerin and water to the stone.

3,577,245
BORON NITRIDE ARTICLE HAVING IMPROVED THERMAL STABILITY
Herbert C. Quandt, Lakewood, Ohio, assignor to Union Carbide Corporation
No Drawing. Filed Nov. 3, 1967, Ser. No. 680,330
Int. Cl. C04b *33/00;* **C01b** *21/06*
U.S. Cl. 106—39 **5 Claims**

Method of improving the high temperature stability of boron nitride articles by treatment with calcium cyanamide.

3,577,246
REFRACTORY SHAPE WITH PREREACTED GRAIN
Joseph E. Neely, Los Gatos, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
No Drawing. Filed Nov. 25, 1968, Ser. No. 778,764
Int. Cl. C04b *35/42*
U.S. Cl. 106—59 **8 Claims**

A refractory shape of lower porosity and enhanced high temperature strength is made from coarse refractory grain retained on a 100 mesh screen and prereacted magnesia-chrome grain passing a 100 mesh screen by incorporating from about 0.5% to about 15%, by weight of the total composition, finely divided alumina.

3,577,247
MAGNESIUM ALUMINATE SPINEL BONDED REFRACTORY
Bernard D. McKenna, San Jose, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
No Drawing. Filed Nov. 25, 1968, Ser. No. 778,756
Int. Cl. C04b *35/44*
U.S. Cl. 106—62 **7 Claims**

A magnesium aluminate spinel bonded shape is made by admixing refractory grain retained on a 100 mesh screen with magnesium aluminate grain passing a 100 mesh screen and containing up to three moles of magnesia for each mole of alumina, and sufficient −100 mesh alumina to react with the −100 mesh magnesium aluminate grain to form a matrix containing not over 1.25 moles of magnesia for each mole of alumina, and firing the admixture after forming it into a shape.

3,577,248
LOW MOLECULAR WEIGHT LINEAR ALKYL BENZENE SULFONATE AS FROTHING AGENTS FOR GYPSUM BOARD MANUFACTURE
Robert B. Doan, Drexel Hill, and Robert C. Taylor, King of Prussia, Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.
No Drawing. Filed Nov. 6, 1967, Ser. No. 680,989
Int. Cl. C04b *11/00*
U.S. Cl. 106—111 **8 Claims**

This invention relates to gypsum boards and to a method for producing the board which utilizes as a frothing agent an alkyl benzene sulfonate having a linear secondary alkyl side chain with an average carbon content ranging from 8.5 to 10.5 and a maximum carbon number spread of 8 carbon atoms. Preferably, the average carbon content ranges from 9.5 to 10.5 and the carbon number spread is a maximum of 5 carbon atoms. This frothing agent is generally utilized in amounts ranging from 0.01 to 0.1 part per 100 parts by weight gypsum.

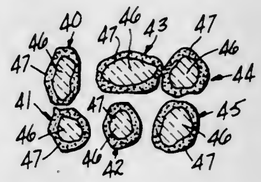
3,577,249
BITUMINOUS DISPERSIONS HAVING IMPROVED ADHESION AND PROCESS THEREOF
Jack N. Dybalski, Chicago, Ill., assignor to Armour Industrial Chemical Company, Chicago, Ill.
No Drawing. Filed Feb. 10, 1969, Ser. No. 798,135
Int. Cl. C08h *13/00;* **C08k** *1/62;* **C09d** *3/24*
U.S. Cl. 106—269 **9 Claims**

Bituminous dispersion containing a bituminous phase in an amount from 20–90 wt. percent can be provided with unusually good adhesion by the addition of certain aryl-substituted aliphatic nitrogen compounds. These compounds are long chain mono-aralkyl or di-aralkyl amines, aralkyl diamines, and their oil-soluble salts.

3,577,250
METHOD OF RUBBERIZING ASPHALT
Fritz S. Rostler, Berkeley, Calif., assignor to Phillips Petroleum Company, Bartlesville, Okla.
No Drawing. Filed Mar. 20, 1968, Ser. No. 714,424
Int. Cl. C08h *13/00;* **C08j** *1/46;* **C09d** *3/24*
U.S. Cl. 106—278 **16 Claims**

Method of incorporating an elastomer into asphalt by treating the asphalt pavement with an emulsion having an external water phase and an oil phase containing a dissolved elastomer, the oil preferably having an initial boiling point of not substantially less than 300° C. at 760 mm. Hg and a viscosity of above about 50 SUS at 210° F., the oil being mutually compatible with the asphalt and the elastomer.

3,577,251
MOLDING POWDER FOR PROJECTABLE TARGET
Vernon C. Moehlman, St. Louis, and Robert J. Klein, Florissant, Mo., assignors to Olin Corporation
Continuation of application Ser. No. 680,276, Sept. 14, 1967, which is a division of application Ser. No. 569,283, Aug. 1, 1966, which in turn is a continuation-in-part of application Ser. No. 338,031, Jan. 16, 1964. This application Feb. 26, 1969, Ser. No. 804,370
Int. Cl. C08h *13/00*
U.S. Cl. 106—284 **9 Claims**



A molding powder adapted to be briquetted to a coherent but brittle compact of the size and shape of a

frangible target of the projectable type. The molding powder comprises granules of limestone all of which are at least partially encapsulated by a coal tar pitch.

3,577,252

PROCESS OF PRODUCING ZIRCONIUM SILICATE CERAMIC COLORING SUBSTANCES

Wilhelm Brugger, Essen, Germany, assignor to Th. Goldschmidt A.G., Essen, Germany

No Drawing. Filed Sept. 11, 1968, Ser. No. 759,223
Claims priority, application Germany, Sept. 13, 1967, P 16 46 550.2
Int. Cl. C03c *5/02;* **C09c** *1/00*
U.S. Cl. 106—299 **8 Claims**

Process of producing ceramic coloring substances suitable as glaze stains. Metal oxide containing, color producing mixtures are calcined or sintered in the presence of 1–5% by weight, calculated on the amount of the mixture to be sintered, of a halogenated hydrocarbon having a boiling or sublimation point above 50° C.

3,577,253

TITANIUM DIOXIDE PIGMENT COMPOSITION

Warren M. Foss, Metuchen, N.J., assignor to National Lead Company, New York, N.Y.

No Drawing. Filed Aug. 28, 1968, Ser. No. 755,776
Int. Cl. C09c *1/36, 3/02;* **C09d** *5/02*
U.S. Cl. 106—300 **4 Claims**

This invention describes a new type of titanium dioxide pigment composition which is vastly superior to any of the prior art pigments when used in acrylic systems, such as thermosetting or thermoplastic acrylic automotive finishes and exterior acrylic latex paints. The new titanium dioxide pigment composition is finely divided TiO_2 pigment particles containing a calcined coating of

$$SiO_2\text{-}Al_2O_3\text{-}Na_2O$$

composition in which the ratio of SiO_2 to Al_2O_3 is 3–8 to 1 and the ratio of SiO_2 to Na_2O is 5–20 to 1. The amount of coating is from 5% to 12%. A method for the preparation of this pigment composition is also described. The $SiO_2\text{-}Al_2O_3\text{-}Na_2O$ composition is precipitated onto the surface of the pigment at pH 3.5–6.5 and after adjusting the pH to 7.0–8.5 the coated TiO_2 pigment is calcined at 700–825° C.

3,577,254

PIGMENT DISPERSIONS

Frederick E. Petke, Princeton, N.J., assignor to Cities Service Company

No Drawing. Filed Mar. 22, 1968, Ser. No. 715,151
Int. Cl. C09c *3/02*
U.S. Cl. 106—308 **17 Claims**

Highly concentrated, stable base pigment dispersions in organic solvents are prepared by adding pigment to an organic solvent in the presence of surfactant. The rate of pigment addition is adjusted so that proper wetting out of the pigment in the solvent occurs. Pigment addition is continued until a high shear mass is obtained. This mass is then subjected to agitation for a sufficient period of time to break down pigment agglomerates and to disperse the pigment throughout the organic solvent. In order to obtain a base pigment dispersion composition that can be readily mixed with additional solvent and binder material, the viscosity of the high shear mass may be reduced by mixing additional organic solvent therewith. Pigment concentrations of from about 45% to about 90% by weight of the resulting base pigment dispersions are obtained. Any suitable binder material may be thereafter incorporated in the base pigment dispersion composition to produce a finished pigment-binder dispersion composition of high gloss and excellent dispersion characteristics.

3,577,255

PIGMENT DISPERSIONS

Frederick E. Petke, Princeton, N.J., assignor to Cities Service Company

No Drawing. Continuation-in-part of application Ser. No. 715,151, Mar. 22, 1968. This application Nov. 29, 1968, Ser. No. 780,298
Int. Cl. C09c *3/02*
U.S. Cl. 106—308 **19 Claims**

Highly concentrated stable base pigment dispersions in organic solvents are prepared by adding pigment to an organic solvent or a blend of miscible organic solvents in the presence of surfactant. The rate of pigment addition is adjusted so that proper wetting out of the pigment in the solvent occurs. Pigment addition is continued until a high shear mass is obtained. This mass is then subjected to agitation for a sufficient period of time to break down pigment agglomerates and to disperse the pigment throughout the organic solvent. In order to obtain a base pigment dispersion composition that can be readily mixed with additional solvent and binder material, the viscosity of the high shear mass may be reduced by mixing additional organic solvent therewith. Pigment concentrations of from about 45% to about 90% by weight of the resulting base pigment dispersions are obtained. Any suitable binder material may thereafter be incorporated in the base pigment dispersion composition to produce a finished pigment-binder dispersion composition of high gloss and excellent dispersion characteristics. Great adaptability in determining the characteristics of the final coating composition can be achieved when the pigment is initially dispersed in a solvent blend rather than a single organic solvent. In addition, the desirable properties of the final composition are often enhanced by the use of such a solvent blend.

3,577,256

SCRATCH AND ABRASION RESISTANT COATINGS FOR GLASS

Charles L. Benford, Jr., and James E. Mielke, Toledo, Ohio, assignors to Owens-Illinois, Inc.

No Drawing. Continuation of application Ser. No. 480,130, Aug. 16, 1965. This application June 26, 1969, Ser. No. 841,677
Int. Cl. C03c *17/32*
U.S. Cl. 117—6 **6 Claims**

Freshly formed glass tubing is provided with a water soluble, scratch and abrasion resistant coating which may also be removed by volatilization at annealing temperatures. The coating is applied as an aqueous solution containing 0.5% to 2% of an acrylic solution resin, 0.75% to 1.5% polyoxyethylene glycol and 0.075% to 0.25% melamine-formaldehyde solution resin. The solution may also include 0.025% to 0.05% polyvinyl alcohol.

3,577,257

METHOD FOR FORMING DECORATIVE POLYURETHANE COATINGS

George J. Hutzler, Williamsville, and Carl L. Schwenk, Cheektowaga, N.Y., assignors to Textron Inc.

No Drawing. Filed Oct. 30, 1968, Ser. No. 771,988
Int. Cl. B44d *1/16;* **B44c** *1/06*
U.S. Cl. 117—26 **10 Claims**

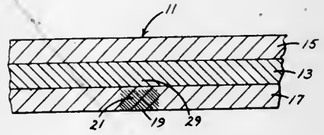
There is disclosed a method for forming decorative polyurethane coatings and in the procedure a solid substrate is coated with a liquid polyurethane composition, for instance, of the moisture-curing type. While the thus applied polyurethane is still tacky, particulate pigment solids bearing a curing aid for polyurethanes are placed on the coating. The solids-bearing coating is then covered with a clear polyurethane which again may be of the moisture-curing variety, and the curing air which is an integral part of the pigment solids has a curing effect on both the underlying and overlying polyurethane coatings. The pigmented solids thus exert a decorative or coloring effect through the overlying clear coating. The curing aid may be either of the catalytic or reactive type. Since the curing aid is included in the particulate solids which do not contact the polyurethane vehicles until they are in place on the supporting substrate, the vehicles as a result, have adequate working time, and construction jobs, for instance, wherein the vehicles are formed as a monolithic or seamless flooring can be planned and executed with facility. The particulate solids are frequently thin chips composed of finely divided pigment solids, binder and curing aid.

3,577,258

WRAPPING MATERIAL FOR MOISTURE-CONTAINING ARTICLE AND METHOD FOR MAKING THE SAME

Joseph T. Sincavage, Knowltonwood, Pa., Carl R. Pepmeier, Fredericksburg, Va., and Louis E. Stoffregen, Springfield, Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 19, 1968, Ser. No. 714,281
Int. Cl. B44d *1/44;* **B32b** *23/08*
U.S. Cl. 117—62 **6 Claims**



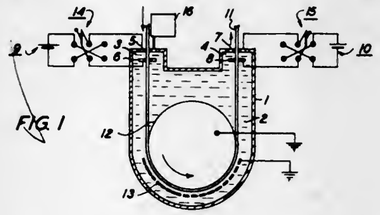
A wrapping material for encasing moisture-containing products formed of a non-fibrous, hydrophilic regenerated cellulose sheet having on at least one side thereof a coating of moistureproof material, such as, nitro-cellulose, polyethylene, vinyl copolymers, vinylidene copolymers, with the coated side having a selected area of lower moistureproof properties than the remainder thereof whereby the portion of the regenerated cellulose sheet adjacent to such selected area of a coated side is more receptive to moisture and thus more frangible than the remainder thereof.

3,577,259

LIQUID DEVELOPMENT OF ELECTROSTATIC LATENT IMAGES UTILIZING A TONER-FREE ZONE

Masamichi Sato, Yasuo Tamai, and Seiji Matsumoto, Asaka-shi, and Goro Akashi, Odawara-shi, Japan, assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 19, 1968, Ser. No. 760,956
Int. Cl. C03g *13/10, 15/10*
U.S. Cl. 117—37 **15 Claims**



Images are formed by providing a liquid developer bath comprising a continuous insulating liquid carrier phase and a discontinuous particulate toner phase, forming in the bath at least one zone substantially free of the toner phase, transporting an imaging member bearing an electrostatic latent image through the toner-free zone and thereafter passing the imaging member through the remainder of the bath. The imaging member may be transported through a substantially toner-free zone in the bath after development of the latent image to further improve image quality.

3,577,260

DECORATIVE ARTICLE AND METHOD OF MANUFACTURE THEREFOR

Roberta J. Hanna, 7555 Ashburn St., Houston, Tex. 77017

No Drawing. Filed Nov. 21, 1967, Ser. No. 685,247
Int. Cl. B44d *1/02;* **B44c** *5/06*
U.S. Cl. 117—68 **5 Claims**

A manufactured, decorative article and method preferably formed on a base material having the desired shape and serving as a source of pigmentation wherein a resin coating essentially dissolves the base member while maintaining its shape, and dries with the pigmentation fused therethrough to define a decorative body having a desired color and texture of surface.

3,577,261

SUBSTRATE WITH ADHERENT LAYER HAVING COLOR IMPARTED BY SAID SUBSTRATE

Kenneth K. Klar, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Nov. 25, 1968, Ser. No. 778,778
Int. Cl. B32b *25/04, 27/20*
U.S. Cl. 117—80 **4 Claims**

A composite structure comprising a substrate and an adherent layer deposited thereon having a color imparted by the substrate prepared by the method which comprises (A) obtaining a substrate comprising a mixture of a rubbery polymer selected from the group consisting of natural rubber and synthetic rubber, at least one rubber processing oil and a dye soluble in the processing oil, (B) depositing a layer on the surface of the substrate comprising a mixture of a particulate pigment and a solvent for the said dye, the said layer colored by the pigment in contrast to the color of the dye and the color of the substrate, (C) dissolving a portion of the dye in the solvent contained in the deposited layer to effect a change in color of the layer, and (D) substantially drying the said layer.

3,577,262

POLYESTER-SILOXANE COATED PRODUCT

John D. Nordstrom, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

No Drawing. Filed Nov. 18, 1968, Ser. No. 776,780
Int. Cl. B44d *1/50;* **B41m** *7/00*
U.S. Cl. 117—93.31 **8 Claims**

A radiation-curable, film-forming paint binder is prepared from an alpha-beta olefinically unsaturated polyester and an alpha-beta olefinically unsaturated siloxane formed by reacting a siloxane having at least two functional groups selected from hydroxyl groups and hydrocarbonoxy groups with a hydroxyl bearing ester of an alpha-beta olefinically unsaturated carboxylic acid. The binder may also include vinyl monomers. The preferred hydroxyl bearing esters are acrylates and methacrylates. The paint binder is applied as a liquid film to a substrate and cured thereon by an electron beam.

3,577,263
EPOXY RESIN-SILOXANE COATED ARTICLE
John D. Nordstrom, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.
No Drawing. Filed Nov. 18, 1968, Ser. No. 777,551
Int. Cl. B44d *1/50, 1/44*
U.S. Cl. 117—93.31 **8 Claims**

A radiation-curable, film-forming paint binder is prepared from an alpha-beta olefinically unsaturated epoxy resin and an alpha-beta olefinically unsaturated siloxane having at least two functional groups selected from hydroxyl groups and hydrocarbonoxy groups with a hydroxyl bearing ester of an alpha-beta olefinically unsaturated carboxylic acid. In a preferred embodiment, the binder solution also contains vinyl monomers. The preferred hydroxyl bearing esters are acrylates and methacrylates. The paint binder is applied as a liquid film to a substrate and cured thereon by an electron beam.

3,577,264
SILOXANE-UNSATURATED ESTER COATED PRODUCT
John D. Nordstrom, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.
No Drawing. Filed Nov. 18, 1968, Ser. No. 776,779
Int. Cl. B44d *1/50;* **B41m** *7/00*
U.S. Cl. 117—93.31 **7 Claims**

A radiation-curable, film-forming paint binder is prepared by creating a solution of vinyl monomers and an alpha-beta olefinically unsaturated siloxane formed by reacting a siloxane having at least two functional groups selected from hydroxy groups and hydrocarbonoxy groups with a hydroxyl bearing ester of an alpha-beta unsaturated carboxylic acid, e.g. hydroxy acrylates, methacrylates, cinnamates and crotonates. The preferred hydroxyl bearing esters are acrylates and methacrylates. The paint binder is applied as a liquid film to a substrate and cured thereon by an electron beam.

3,577,265
VINYL RESIN-SILOXANE COATED ARTICLE
John D. Nordstrom, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.
No Drawing. Filed Nov. 18, 1968, Ser. No. 776,781
Int. Cl. B44d *1/50;* **B41m** *7/00*
U.S. Cl. 117—93.31 **9 Claims**

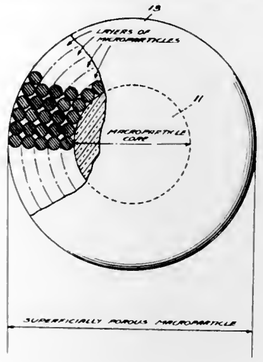
A radiation-curable, film-forming paint binder is prepared from an alpha-beta olefinically unsaturated vinyl monomer-comprising binder resin and an alpha-beta olefinically unsaturated siloxane having at least two functional groups selected from hydroxyl groups and hydrocarbonoxy groups with a hydroxyl bearing ester of an alpha-beta olefinically unsaturated carboxylic acid. In a preferred embodiment, the binder solution also contains vinyl monomers. The preferred hydroxyl bearing esters are acrylates and methacrylates. The paint binder is applied as a liquid film to a substrate and cured thereon by an electron beam.

3,577,266
SUPERFICIALLY POROUS CHROMATOGRAPHIC PACKING WITH SULFONATED FLUORO-POLYMER COATING
Joseph J. Kirkland, New Castle County, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Jan. 13, 1969, Ser. No. 790,724
Int. Cl. B44d *5/00*
U.S. Cl. 117—100 **8 Claims**

A coating of a polymer of the compound

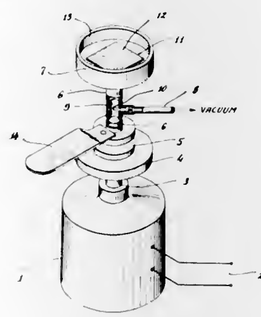
$$CF_2{=}CFOCF_2\underset{\displaystyle CF_3}{\underset{|}{C}}FOCF_2CF_2SO_3H$$

on a support of superficially porous siliceous beads serves as a sorptively active, chemically stable chromatographic



packing material. Such chromatographic packing permits highly selective, high-speed cationic exchange separations of a wide variety of mixtures.

3,577,267
METHOD OF PREPARING BLOOD SMEARS
Kendall Preston, Jr., New Haven, Conn., and Philip E. Norgren, Boulder, Colo., assignors to the United States of America as represented by the Secretary of Health, Education, and Welfare
Filed Mar. 19, 1968, Ser. No. 714,279
Int. Cl. B44d *1/02*
U.S. Cl. 117—101 **2 Claims**

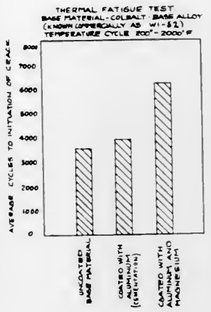


A method of producing blood smears which includes depositing a quantity of blood on a surface, preferably glass, and rotating the surface about a central, perpendicular axis at a high speed for a short time. Preferably, the surface is accelerated within less than ten milliseconds to a speed in the range of from 4,000 to 10,000 r.p.m. The surface is maintained at this speed for a very short time, on the order of a few tenths of a second. The result is a uniform monolayer of flattened, undamaged blood cells.

3,577,268
METHOD OF COATING IRON, NICKEL OR COBALT ALLOY WITH ALUMINUM
Marshall G. Whitfield, Brookfield, Richard S. Parzuchowski, Danbury, and Dennis B. Moore, Ridgefield, Conn., assignors to Cabot Corporation
Continuation of application Ser. No. 413,771, Nov. 25, 1964. This application Mar. 12, 1969, Ser. No. 809,471
Int. Cl. C23c *9/02*
U.S. Cl. 117—107.2 **12 Claims**

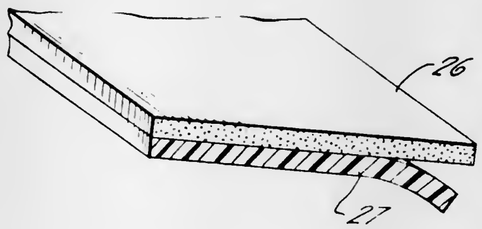
A process for coating an iron, nickel or cobalt base alloy is provided which comprises treating a surface of the

selected alloy with a material consisting essentially of from about 10 to 30 weight percent magnesium with the balance being aluminum and then heating the so-treated



alloy in a non-oxidizing atmosphere to a temperature above about 1800° F. to cause the aluminum-magnesium material to coat and diffuse into the treated surface of the iron, nickel or cobalt base alloy.

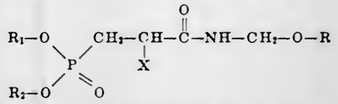
3,577,269
LOW TEMPERATURE TAR TAPE
William J. O'Brien, Hamden, Conn., and Raymond E. Downey, Copley, Ohio, assignors to Dart Industries Inc.
Filed Oct. 23, 1968, Ser. No. 769,996
Int. Cl. C09j *7/02, 7/04*
U.S. Cl. 117—122 **16 Claims**



A tape, and a process for manufacturing it, which can be used to protect pipe lines and which can be applied at temperatures as low as −20° F. and which has a backing layer and an adhesive layer containing an amorphous form of coal tar known as coal tar wax oil.

3,577,270
PROCESS FOR RENDERING CELLULOSIC FIBERS FLAME RESISTANT
Christian Guth, In den Klostermattern 28, Basel, Switzerland; Hermann Nachbur, Schlossweg 54, Dornach, Switzerland; and Arthur Maeder, Hochfeldweg 20, Therwil, Switzerland
No Drawing. Continuation-in-part of abandoned application Ser. No. 640,518, May 23, 1967. This application Oct. 29, 1969, Ser. No. 872,361
Claims priority, application Switzerland, June 1, 1966, 7,941/66
Int. Cl. C09d *5/18;* **C09k** *3/28*
U.S. Cl. 117—136 **7 Claims**

Cellulosic fibrous materials, especially textile materials, can be advantageously rendered flame resistant by applying to them an aqueous preparation of certain phosphorus compounds. The preparations have a pH-value below 3 and contain at least one compound of the formula



(1)

in which R represents a hydrogen atom, an alkyl radical or alkenyl radical, R_1 and R_2 each represents an alkyl, halogenalkyl or alkenyl radical containing up to 4 carbon atoms and X represents a hydrogen or halogen atom, a methyl group or a group of the formula

$$-CH_2-CO-NH-CH_2-O-R$$

where R has the above meaning.

The material so treated must then be dried, and subjected to a heat treatment at a temperature above 100° C. To achieve a flame-resistant finish fast to washing it is not necessary to add an aminoplast to the aqueous preparation as has been generally done heretofore. The present flame-resistant finish will withstand several washes or dry cleaning operations and the textile mechanical properties such as tear strength will be impaired but very little.

3,577,271
TEXTILE BOBBIN
Roger Bliven, Hopedale, Frank L. Allen, Jr., Hudson, and John R. Davis, Uxbridge, Mass., assignors to John Donald Marshall and Horace L. Bomar, Trustees of The Carolina Patent Development Trust
No Drawing. Continuation of application Ser. No. 607,626, Jan. 6, 1967. This application June 6, 1969, Ser. No. 858,552
Int. Cl. B44d *1/28*
U.S. Cl. 117—148 **1 Claim**

A wooden bobbin is disclosed having synthetic resins of the acrylic group impregnated entirely within the dimensions of the bobbin to provide a surface which shall be physically and chemically resistant to a variety of man-made yarns.

3,577,272
METHOD OF MAKING X-RAY SENSITIVE ELECTRORADIOGRAPHIC ELEMENTS
Raymond F. Reithel, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,195
Int. Cl. B44d *1/18;* **G03c** *1/00*
U.S. Cl. 117—201 **10 Claims**

Electroradiographic elements containing, as a photoconductor, tetragonal lead monoxide prepared by heating orthorhombic lead monoxide in water and subjecting the material to a post heat treatment are sensitive to X-radiation and useful in electroradiography.

3,577,273
PRODUCING A TRANSPARENT COPPER COATING ON A SURFACE
Leif Erik Roland Soderberg, Lidingo, Sweden, assignor to Aga Aktiebolag, Lidingo, Sweden
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,174
Claims priority, application Sweden, Nov. 30, 1967, 16,456/67
Int. Cl. H05b *33/28*
U.S. Cl. 117—211 **7 Claims**

A copper coating having a permanent value of electrical resistance is provided on a non-metallic surface, specially a glass surface, by means of a treatment with a solution of SnF_2.

3,577,274

RESIN COATINGS CONTAINING ZINC INCLUSIONS

Charles W. Taylor, Jr., Akron, and Daniel T. Conrad, Cuyahoga Falls, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Nov. 15, 1968, Ser. No. 776,267

Int. Cl. H01l *5/16*

U.S. Cl. 117—213 8 Claims

Corrosion resistance together with electrical insulation is provided for ferrous substrates by a solid resinous coating containing between 9 to 35 percent by weight (1.6 to 10 percent by volume) of pulverulent zinc in a heat fusible resin such as polyester. The coating may be applied by any suitable powder coating method, e.g. fluidized-bed. The application process and articles produced thereby are disclosed.

3,577,275

SEMI-CONDUCTOR CRYSTAL SUPPORTS

John C. Kosco, St. Marys, Pa., assignor to Stackpole Carbon Company, St. Marys, Pa.

No Drawing. Continuation-in-part of application Ser. No. 569,575, Aug. 2, 1966. This application Apr. 2, 1969, Ser. No. 812,854

Int. Cl. C23c *13/08*

U.S. Cl. 117—213 5 Claims

Semi-conductor crystal supports comprising a base of the group consisting of tungsten and molybdenum are prepared by oxidizing at least the surface of the base to which a current lead is to be soldered, coating at least that surface of the base with a metal of the group consisting of silver and copper, and then subjecting the coated base to hydrogen or other reducing atmosphere at a temperature above the melting point of the coating metal. Preferably the density of the base is at least 93 percent of theoretical.

3,577,276

ELECTRICAL RESISTORS

James Edge, Morpeth, England, assignor to Welwyn Electric Limited, Bedlington, Northumberland, England

Original application Sept. 26, 1967, Ser. No. 670,687. Divided and this application Nov. 12, 1969, Ser. No. 871,279

Claims priority, application Great Britain, Sept. 27, 1966, 43,028/66

Int. Cl. C23b *5/62*

U.S. Cl. 117—213 2 Claims

Electrical precision resistors having a ceramic former are provided with a resistance film of a nickel-phosphorus alloy with an electrical surface resistance value between 0.5 ohm to 500 kilohms per square, the alloy containing from 5 to 16% by weight of phosphorus, the thickness of the film varying from 220 A. to 25,000 A. and the root-mean-square deviation of film thickness between different samples of area with a dimension greater than 0.01 x 0.01 cm. is at most 8% of the mean thickness at the lowest electrical resistance value and at most 4% at the highest electrical resistance value; the manufacture of these resistors is effected batch-wise by a method involving reactivating a catalytic palladium layer, before electrolessly depositing the nickel-phosphorus film while tumbling the resistors in the plating solution, by washing with a reactivating solution containing hypophosphite and nickel ions, and the deposited nickel-phosphorus film is stabilized by heating in air to a temperature of from 100 to 400° C.

3,577,277

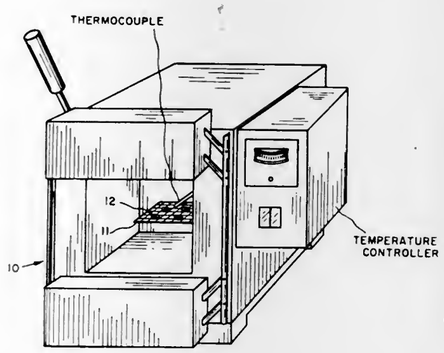
POLYMER COATINGS

Robert D. Fisher, Woodstock, and James A. Magee, Saugerties, N.Y., assignors to Ferroxcube Corporation, Inc., Saugerties, N.Y.

Filed Dec. 26, 1968, Ser. No. 786,998

Int. Cl. H01f *10/02*; B44d *1/46*

U.S. Cl. 117—234 2 Claims



A post treatment process of improving the characteristics of poly p-(xylylene) coated ferrite articles by heating the article to at or just above the melting point of the polymer and maintaining the temperature for a specified duration.

3,577,278

ARTICLE SURFACE TREATING APPARATUS AND METHOD

Robert L. Rohr, Scarsdale, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1968, Ser. No. 786,067

Int. Cl. B08b *3/02*

U.S. Cl. 134—1 12 Claims

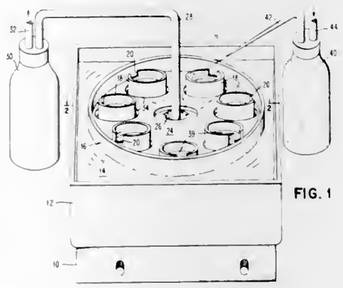


FIG. 1

An article surface treating apparatus is described herein in which an article holder having a plurality of articles mounted thereon is buoyantly disposed in a tank containing a fluid. The article holder is continuously caused to rotate by a stream of a liquid solution impinging thereon, so as to cause the successive surface treatment of the articles. The articles may be subjected to a process, e.g. (cleaning and rinsing or etching and rinsing) wherein several solutions may be programmed to serially treat the surfaces of the plurality of articles.

3,577,279

METHOD AND APPARATUS FOR AUTOMATICALLY CLEANING SYRINGES

Gene E. Lightner, Kennett Square, Pa., and Howard Blair Muhlestein, Wilmington, and Louis E. Green, Newark, Del., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 26, 1968, Ser. No. 779,019

Int. Cl. B08b *9/00*

U.S. Cl. 134—23 13 Claims

A sealed chamber is placed on the plunger end of an otherwise conventional syringe. The plunger is automatically moved axially through the sealed chamber. A wash solvent is introduced in the chamber such that as the plunger is withdrawn from the syringe, the plunger is cleaned by the solvent. Next a drying gas is introduced into the chamber to force the wash solvent down through the syringe, thereby cleaning the syringe and the syringe needle with the wash solvent. The plunger is reinserted in the syringe and the syringe is ready for reloading.

3,577,280

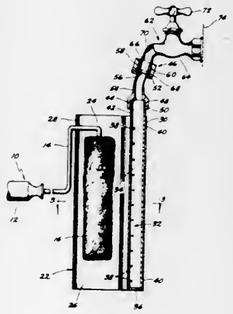
FAUCET-MOUNTED CLEANING DEVICE FOR PAINT ROLLERS

Robert W. George, 5620 26th Ave. S., Minneapolis, Minn. 55417

Filed Apr. 2, 1969, Ser. No. 812,694

Int. Cl. B08b *3/00*

U.S. Cl. 134—138 3 Claims



A cylindrical casing has an open top and open bottom. A tubular member secured to the casing is provided with a series of vertically spaced apertures which spray water onto the paint roller when inserted through the open top, the water being free to drain through the open bottom after impinging upon the paint roller. The upper end of the tubular member is equipped with coupling means for attaching the tubular member directly to a faucet so that the entire device is supported by the faucet when cleaning the roller.

3,577,281

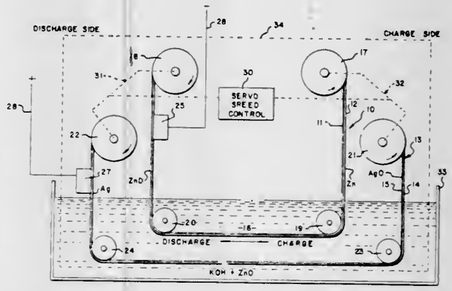
RECHARGEABLE MOVING TAPE CELL

Clifford Harold Pountney and Edward Francis Miller, Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 28, 1969, Ser. No. 819,548

Int. Cl. H01m *35/00*

U.S. Cl. 136—6 20 Claims



A rechargeable cell comprising, in a charged state, a bulk aqueous electrolyte of potassium hydroxide saturated with zinc oxide; a cathode; and an anode comprising a long steel tape coated with zinc on its active surface. The tape is driven from a storage reel through a region in the electrolyte adjacent to the cathode, and onto a takeup reel, at speeds dependent on the load current or voltage, or both. During charging, the tape is driven in the opposite direction. The cathode may be a stationary air permeable electrode; or it may comprise a tape similar to the anode and tape and similarly driven, coated with silver oxide on its active surface.

3,577,282

METHOD OF OXIDIZING TIN

Walter A. Schubert, South Elgin, Ill., assignor to Elgin Metal Casket Company, Elgin, Ill.

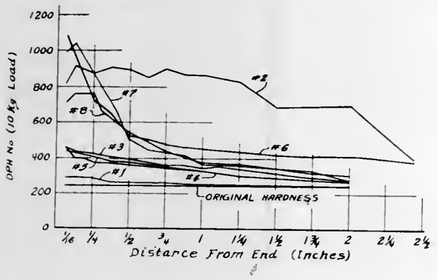
No Drawing. Filed Apr. 1, 1969, Ser. No. 812,331

Int. Cl. C23f *5/02, 7/00*

U.S. Cl. 148—6.24 9 Claims

A method of plating metallic articles with tin and of treating the tin plated articles to produce oxidation or the appearance of oxidation. The method includes an acid treatment of metallic articles which have been plated with tin by any suitable method of plating, by means of which the tin plate is altered to provide an appearance of oxidation and they may be mechanically treated thereafter to remove some of the material to produce an effect sometimes called "antiquing."

3,577,283
METHOD OF CASEHARDENING VANADIUM AND VANADIUM ALLOYS
John A. Zic, Oak Lawn, and George F. Hill, Chicago, Ill., and Ross M. Mayfield, deceased, late of Glen Ellyn, Ill., by Georgia P. Mayfield, sole heir, Glen Ellyn, Ill., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed Mar. 7, 1969, Ser. No. 805,384
Int. Cl. C21d *1/74*
U.S. Cl. 148—20.3 **1 Claim**



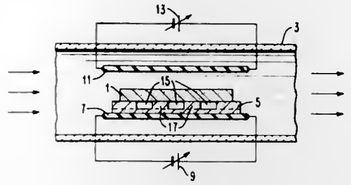
A method of casehardening vanadium and vanadium alloys consisting predominantly of vanadium by heating the material briefly at 1100 to 1300° C. in an atmosphere of argon saturated with water vapor.

3,577,284
ACTIVATED FLUX
Alvin Schneider, Edison, and Joseph Tarnowsky, Teaneck, N.J., assignors to Alpha Metals, Inc., Jersey City, N.J.
No Drawing. Filed Apr. 7, 1969, Ser. No. 822,821
Int. Cl. C23c *1/12*
U.S. Cl. 148—23 **28 Claims**

A flux for low melting point alloys composed of a fluxing agent and an activating agent of a phenacyl halide or a derivative thereof, which does not exceed safe limits for corrosion and electrical properties.

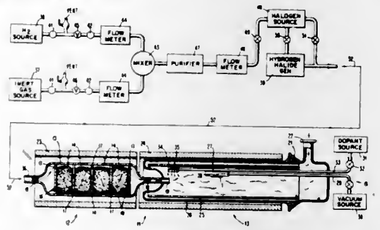
3,577,285
METHOD FOR EPITAXIALLY GROWING SILICON CARBIDE ONTO A CRYSTALLINE SUBSTRATE
Richard F. Rutz, Cold Spring, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 28, 1968, Ser. No. 716,928
Int. Cl. H01l *7/36;* **C01b** *31/36;* **C23c** *11/00*
U.S. Cl. 148—175 **9 Claims**

Epitaxial growth of semiconductive materials is effected in an inert atmosphere by physically contacting the surfaces of a source of semiconductive material to particular surface areas of a crystalline substrate onto which such growth is to be effected. The source is heated to a temperature to cause rapid vaporization of the semi-conductive material; the substrate is maintained at a slightly lower temperature to promote the condensation and epitaxial growth of the vaporized semiconductive material on the contacted substrate surfaces. The surface of the source can be preformed so as to grow particular patterns of the semiconductive material onto the substrate surface. Conductivity-type determining impurities can be introduced



either into the inert atmosphere or be present in the source so as to impart a particular conductivity to the grown semiconductive material.

3,577,286
SEMICONDUCTOR PREPARATION AND DEPOSITION PROCESS
Melvin Berkenblit and Arnold Reisman, Yorktown Heights, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 11, 1967, Ser. No. 674,471
Int. Cl. H01l *7/36, 7/00;* **C23c** *11/00*
U.S. Cl. 148—175 **6 Claims**



A process which includes the preparation of a substrate and subsequent epitaxial deposition of germanium on the substrate is described. Preparation of the substrate, either germanium or gallium arsenide, includes a chemical treatment step to remove surface films, rapid quenching, rinsing and drying steps, and a heating step prior to deposition. Deposition of germanium is carried out in an open tube disproportionation system, by introducing a germanium halide specie which is capable of disproportionating at a deposition site in concentrations and at velocities such that the deposition of germanium tends to be surface limited rather than mass transport limited. The deposition, preferably carried out on a (110) oriented substrate, is epitaxial, smooth and shiny and is suitable for subsequent processing requiring photographic techniques.

3,577,287
ALUMINUM DIFFUSION TECHNIQUE
John F. Norwich and Edward J. Roesener, Jr., Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed Feb. 12, 1968, Ser. No. 704,676
Int. Cl. H01l *7/44*
U.S. Cl. 148—189 **5 Claims**

A technique for producing an improved aluminum diffusion region in a silicon surface adjacent a surface region that is heavily doped with an N-type impurity such as phosphorus. Improved rectifying junctions sustaining higher back voltages and having lower forward voltage drop and lower reverse current leakage are produced by simultaneously exposing said silicon surface to a P-type impurity such as boorn, during the aluminum diffusion. A pretreatment of a diffusion furnace tube with boron and aluminum is also described.

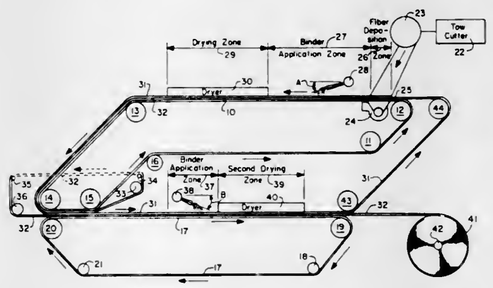
3,577,288
BOEHMITE-COATED ALUMINUM TEXTILE PIRN
Walter G. Zelley and Charles J. Walton, Lower Burrell, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.
No Drawing. Filed Nov. 25, 1968, Ser. No. 778,744
Int. Cl. C23f *7/06;* **B65h** *75/18*
U.S. Cl. 148—6.27 **11 Claims**

A tubular aluminum textile pirn having an alpha-alumina hydrate coating thereon.

3,577,289
COMPOSITE HIGH ENERGY SOLID ROCKET PROPELLANTS AND PROCESS FOR SAME
Jacque C. Morrell, 8 Oxford St., Chevy Chase, Md. 20015
No Drawing. Continuation-in-part of application Ser. No. 404,896, Oct. 19, 1964. This application Feb. 12, 1968, Ser. No. 706,749
Int. Cl. C06d *5/06*
U.S. Cl. 149—19 **6 Claims**

The invention relates to high energy solid rocket propellants comprising an elastomeric organic fuel bindner, a finely divided solid inorganic oxidizing agent, and an additive mixture of finely divided solid combustible high energy substances, one substance more readily ignitable than the other.

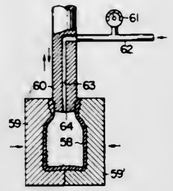
3,577,290
PROCESS OF MAKING A NONWOVEN FABRIC
Ralph J. Baskerville, Jr., and Joseph S. Baker, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Aug. 19, 1968, Ser. No. 753,352
Int. Cl. B31d *1/00*
U.S. Cl. 156—62.2 **6 Claims**



A process of making a nonwoven fabric in which the newly completed nonwoven fabric is recycled and used as a moving support for new fabric web being formed until the latter becomes self-supporting. Then, the superposed webs are separated. The portion that was recycled is removed from the process; the newly completed web portion is continuously recycled as a moving support in the aforesaid manner.

3,577,291
PROCESS FOR CONTINUOUSLY MOLDING BOTTLE FROM THERMOPLASTIC RESIN, CHARGING AND SEALING
Masaaki Uchida, 5, 4-chome, Fukagawa Takahashi, Koto-ku, Tokyo, Japan
Filed Jan. 23, 1969, Ser. No. 793,315
Claims priority, application Japan, Feb. 1, 1968, 43/5,711; Feb. 3, 1968, 43/6,273; Feb. 8, 1968, 43/7,450
Int. Cl. B29c *17/07;* **B65b** *7/16*
U.S. Cl. 156—64 **5 Claims**

A hollow plastic tube is molded of thermoplastic resin. The tube is transferred to a split metal mold and molded therein into the form of a bottle or container. The bottle or container, while still within the split metal mold, is checked for pinholes and/or other crack defects by feed-

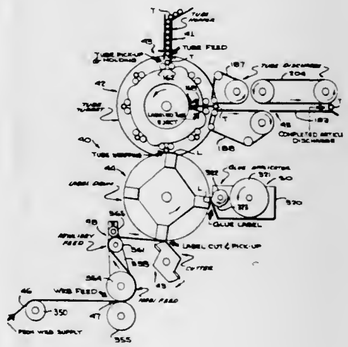


ing compressed air into the bottle. Those bottles or containers found to be non-defective are selected, charged, sealed and packaged.

3,577,292
METHOD FOR JOINING THERMOPLASTIC MEMBERS BY SONIC OR ULTRASONIC ENERGY
Edward G. Obeda, Brookfield, Conn., assignor to Branson Instruments, Incorporated, Stamford, Conn.
Filed Mar. 7, 1969, Ser. No. 805,206
Int. Cl. B29c *27/08*
U.S. Cl. 156—73 **4 Claims**

Juxtaposed thermoplastic members abutting along a common interface surface are joined by contacting both members with a sonically or ultrasonically vibrating horn having toothlike protrusions at its output end. The protrusions are caused to penetrate through the surface of each member and, responsive to the dissipation of energy, cause softened material which is urged to flow across the interface surface to provide, upon hardening, a joint.

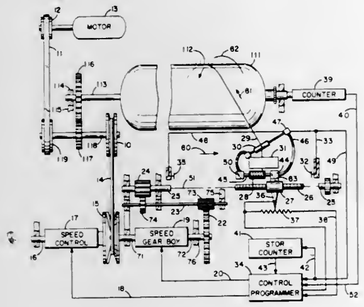
3,577,293
METHOD OF LABELLING CYLINDRICAL OBJECTS
Eric K. Ritterhoff, Hinsdale, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Original application Sept. 19, 1962, Ser. No. 224,660, now Patent No. 3,404,059, dated Oct. 1, 1968. Divided and this application Aug. 9, 1968, Ser. No. 751,439
Int. Cl. B32b *31/20;* **B65c** *3/12*
U.S. Cl. 156—156 **4 Claims**



This disclosure relates to a method of labelling cylindrical objects wherein the objects are primarily in the form of tubes which are flexible. The label is supplied in web form and initially a correct length of the web

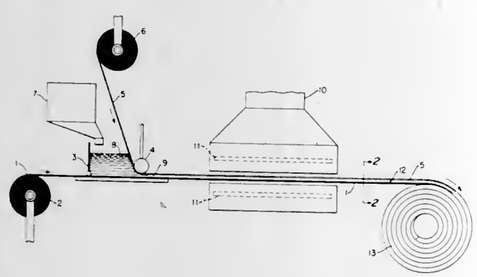
is cut off and carried by a drum past an adhesive applicator after which the section of the web is applied to a tube. The tube is carried by a turret and is pressurized at the time the web is being applied thereto. The tube is rotated during the application of the label with the two being rotated at the same speed as the labels being fed. The labelled tube is later cut into individual sections.

3,577,294
METHOD FOR MAKING 3-D FILAMENT REINFORCED ARTICLES
Constant David, 2625 Loring St., San Diego, Calif. 92109
Filed Mar. 17, 1969, Ser. No. 815,515
Int. Cl. B65h *54/06*
U.S. Cl. 156—173 **10 Claims**



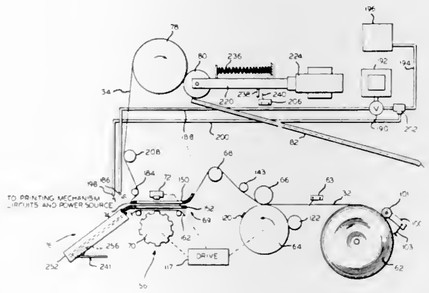
Method and apparatus for making 3-D filament reinforced shells by securing short reinforcing fibers onto a form which fibers project in a substantially normal direction from the surface of the form, and winding in helical arrangement strands coated with plastic resin onto the form either as individual strands or as tapes formed by a plurality of strands, which strands are substantially normal to the fibers.

3,577,295
METHOD OF BONDING TEXTILE FABRIC BELTS
Louis Seelbach Kraft, Stow, and Charles W. Quiner, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Apr. 10, 1968, Ser. No. 720,099
Int. Cl. B32b *5/00*
U.S. Cl. 156—177 **10 Claims**



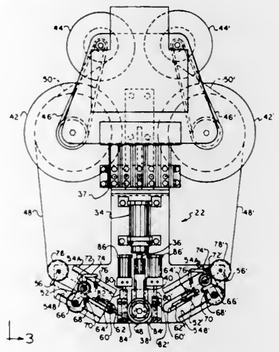
A method of preparing a composite structure comprising at least two support layers adhered to at least one layer of a cured polyurethane interposed therebetween which comprises controllably and continuously feeding support layers through a first station having a rear retaining means, a forward control means, and a reservoir of a liquid polyurethane mixture therein, and curing the polyurethane reaction mixture layer thereby superposed between the said layers to form the said composite structure.

3,577,296
METHOD FOR PRINTING AND APPLYING LABELS
Duane Phillips, Oxford, Roger C. Schultz, Pardeeville, and Herbert H. Beck, Portage, Wis., assignors to Armour and Company, Chicago, Ill.
Original application July 23, 1965, Ser. No. 474,441, now Patent No. 3,461,984, dated Aug. 19, 1969. Divided and this application June 18, 1969, Ser. No. 834,437
Int. Cl. B32b *31/00*
U.S. Cl. 156—249 **7 Claims**



Packages, especially those containing perishable foods, are labeled with pressure-sensitive labels in a process which provides for weighing each package, printing the weight and cost on a label adhered to a backing strip, removing the label from the strip, and applying to the package.

3,577,297
TAPING APPARATUS AND METHOD
James S. Howard, Riverside, Calif., assignor to Rohr Corporation, San Diego, Calif.
Filed Jan. 27, 1969, Ser. No. 794,107
Int. Cl. B32b *31/10, 31/18*
U.S. Cl. 156—265 **6 Claims**



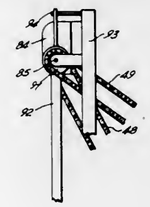
Apparatus for, and method of, laying strips of tape on a surface in adjacently disposed relation from two sides thereof, by means of the arrangement of two tape feeding and two tape cutting mechanisms on opposite sides of a

pressure roller carried by a support head which is adapted to move in opposite directions along parallel paths on said surface.

3,577,298
METHOD OF MAKING A BUILDING PANEL
Scilla de Glauco, 3921 Vasconia St. 33609, and Claudio Poccia, 4746 W. Anita Blvd. 33611, both of Tampa, Fla.
No Drawing. Filed June 5, 1969, Ser. No. 832,553
Int. Cl. B44c *1/06*
U.S. Cl. 156—239 **14 Claims**

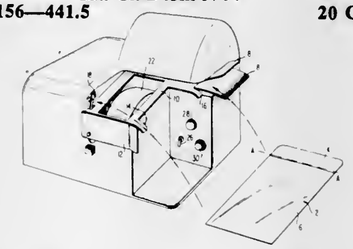
Compositions for building materials such as partitions, walls, etc., which are readily prepared and have all of the architectural requirements for prefabricated building materials. They consist of fiber glass, PVC expansion panels, unsaturable polyester resin, comminuted amethyst rock and, optionally, aerated calcium carbonate, besides the usual accelerators, diluents and catalysts.

3,577,299
REGISTER AND CONTROL APPARATUS FOR CORRUGATOR
Charles H. Klein and James K. Haley, Cincinnati, Ohio, assignors to Novelart Manufacturing Company, Cincinnati, Ohio
Filed Dec. 26, 1968, Ser. No. 787,105
Int. Cl. B32b *31/00;* **B65h** *25/00*
U.S. Cl. 156—361 **5 Claims**



Apparatus for first forming single face corrugated paperboard and thereafter combining it with printed sheets to form double face corrugated board, the disclosure including means for controlling the feed and side register of the constituent webs and sheets.

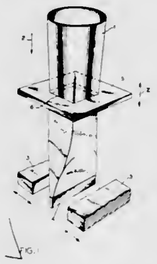
3,577,300
BAG FOLDING AND SEALING APPARATUS
John W. Glaze, Jr., and Joseph P. Worth, Charlotte, N.C., assignors to Intech Corporation, Charlotte, N.C.
Continuation-in-part of application Ser. No. 604,016, Dec. 22, 1966. This application Dec. 1, 1969, Ser. No. 881,175
Int. Cl. B43m *5/04*
U.S. Cl. 156—441.5 **20 Claims**



A shaft driven by a single revolution clutch operates (a) a mechanism for folding a closure flap against the body of a bag, (b) a mechanism for heat sealing the flap to the bag, and (c) a conveying mechanism for ejecting the sealed bag from the apparatus. A movable stop actuated by the shaft serves as a guide for properly locating a bag in the apparatus, and the stop is retracted after a flap is folded to permit ejection of the bag by the conveying mechanism.

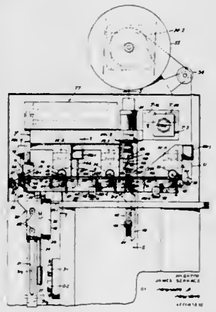
The flap folding mechanism includes a pivoted flap folding plate which has spaced apart openings permitting access of a series of similarly spaced apart heat sealing elements to a folded but unsealed flap.

3,577,301
APPARATUS FOR THE PRODUCTION OF TETRAHEDRAL HOLLOW ARTICLES
Ake Gustafson, Le Chatelet, Chatel-Saint-Denis, Switzerland, assignor to Tetra Pak AG, Zurich, Switzerland
Filed Sept. 28, 1967, Ser. No. 671,397
Claims priority, application Switzerland, Sept. 28, 1966, 13,999/66, 14,000/66
Int. Cl. B32b *31/02*
U.S. Cl. 156—461 **5 Claims**



Tetrahedral hollow articles are produced by forming a tube from a travelling web and passing the tube through a rigid guide means contacting the tube in at least two diametrically opposite regions so as to displace the position of undesirable kinks in the articles formed. Subsequently spaced apart transverse seams are provided across the tube. The guide means may be a plate having a square opening and a flexible sleeve of inelastic material is secured in the square opening. The total internal peripheral length of the opening is substantially equal to the circumference of the tube passing through the opening.

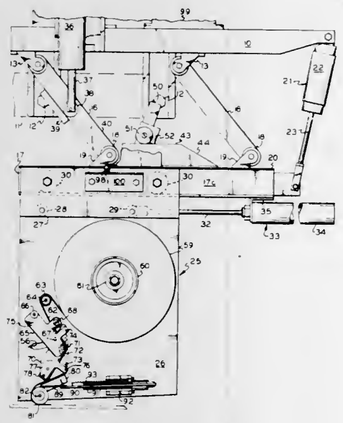
3,577,302
AUTOMATIC FILM SPLICING MACHINE
James Szakacs, 150 Pueblo Road, New Britain, Pa. 18901
Filed May 8, 1968, Ser. No. 727,414
Int. Cl. B65h *21/00;* **G03d** *15/04*
U.S. Cl. 156—504 **20 Claims**



A machine for automatically splicing together lengths of exposed photographic roll film to form a continuous film strip suitable for processing through high speed automatic film processing, printing or other film handling

equipment. The machine includes means for determining the length of a roll of film and for accurately cutting the film in proper registration with the film sprocket holes to remove the spool and paper backer. The machine automatically advances the lead edge of a film into abutting relation with the trailing edge of the preceding film in a splicing station, with the respective film sprocket holes in the proper registration. A strip of heat sealing splicing tape is then automatically inserted beneath the abutting film edges and a heat sealing ram is actuated for a predetermined time to complete the splice. The spliced film is then automatically wound onto a storage reel, the trailing edge of the film strip being stopped in the splicing station for attachment of the succeeding film length.

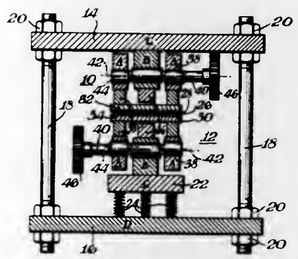
3,577,303
TAPE APPLYING APPARATUS
Erville C. Buck, Springfield, Oreg., assignor to Willamette Valley Company, Eugene, Oreg.
Filed Nov. 18, 1968, Ser. No. 776,525
Int. Cl. B23b *31/18;* **B44c** *7/02*
U.S. Cl. 156—522 **11 Claims**



An apparatus for applying a pressure-sensitive adhesive tape to a surface having a carriage means to support a supply of pressure-sensitive adhesive tape above the surface with a length of the tape hanging down, means to lower the carriage to a point at which the length of tape contacts the surface and adheres thereto, means to advance the carriage horizontally and apply a length of the tape to the surface and simultaneously withdraw a slight excess of tape from the supply, means to sever the tape at a point prior to the termination of the horizontal advance of the carriage, and means to return the carriage to its initial position with the excess tape hanging therebeneath.

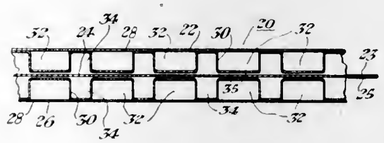
3,577,304
APPARATUS FOR CONTINUOUS LAMINATION
Hubert A. Guyer, 119 Ridgeland Road, Lynnfield, Wilmington, Del. 19803
Filed June 30, 1967, Ser. No. 650,368
Int. Cl. B32b *31/00*
U.S. Cl. 156—555 **13 Claims**

Materials to be laminated are passed between two continuous opposed bodies, as, for example, opposed pressure elements on the backside of two continuous belts which operate in alternation to apply pressure with or without heat, to the belts and hence to the laminate. The pressure elements also move the belt. One of the pressure elements is spring loaded and floating so as to maintain constant pressure at all times on the portion of the belts



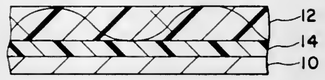
and the material being laminated while said portion is in the laminating process.

3,577,305
THERMAL AND AIR SHOCK INSULATING STRUCTURE
Theodore G. Hines and Wayne C. Engle, both % Pine Instrument Co., 322 Oak St., Grove City, Pa. 16127
Filed Aug. 22, 1968, Ser. No. 754,534
Int. Cl. B32b *3/12, 15/08;* **A41d** *31/00*
U.S. Cl. 161—4 **10 Claims**



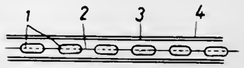
There is disclosed a flexible thermal and shock insulating structure which can be fabricated substantially from layers of plastic material. At least two of the layers are sealed to form a multitude of dead air cells. A reflective member is placed adjacent the dead air cells, and the assembly thus formed is sealed along its peripheral edges to prevent entry of dirt or other foreign material and deterioration of the reflective quality of the reflective surface. The air cell material and the reflective member are not otherwise joined, with the result that the assembly retains sufficient flexibity for use in manufacturing articles of clothing or the like. The assembly is further arranged to present a relatively smooth outer surface for protection of the sealed air cells and to enhance the qualities of the assembly for use as clothing or as other insulated articles subject to relatively rough handling and usage.

3,577,306
POLYMER LAMINATE TO PREVENT SEVERE METAL PETALLING DAMAGE
Ronald E. Baker, Maricopa, Richard L. Cook, Flagstaff, and Edwin C. Slagel, Maricopa, Ariz., assignors to Goodyear Aerospace Corporation, Akron, Ohio
Filed Dec. 30, 1968, Ser. No. 787,716
Int. Cl. B64b *1/14;* **D03d** *11/00*
U.S. Cl. 161—90 **6 Claims**



A dual layer composite laminate consisting of at least one layer of high strength nylon cloth saturated with a polyurethane and cured to be made semi-flexible with a urethane elastomer pad bonded to one surface of the layer. The other surface of the pad is positioned adjacent the internal surface of metal aircraft skins or other metal structural members to prevent the inward protrusion of the material around a projectile hole through the skin or member so as to prevent petalling of the metal skin into the wound upon the passage of the projectile therethrough.

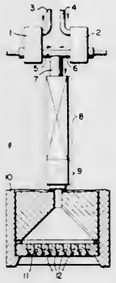
3,577,307
LEAD STRIP FOR WEIGHING DOWN CURTAINS
Franz Baier, Teichstrasse 3, Saerback, Germany, and Rudolf Schmitz, Austum 43, Emsdetten, Germany
Filed Sept. 19, 1966, Ser. No. 580,326
Claims priority, application Germany, Oct. 15, 1965, P 12 97 304.5
Int. Cl. A47h *1/00*
U.S. Cl. 161—175 **3 Claims**



A lead strip to be secured to the lower edge of a curtain or drape as weight means in which the individual lead members are surrounded by a relatively thin, hose-like sleeve made from polyterephthalate foil strip which is formed into a tube upon insertion of the lead member, by means of a glued seam.

3,577,308
MANUFACTURE OF A MULTICOMPONENT POLYMERIC PRODUCT
Korstiaan J. Marinus van Drunen and Wilhelmus J. Fontijn, Dieren, Netherlands, assignors to American Enka Corporation, Enka, N.C.
Filed Aug. 28, 1968, Ser. No. 755,903
Claims priority, application Netherlands, Sept. 27, 1967, 6712079
Int. Cl. D02g *3/00;* **B29f** *3/10*
U.S. Cl. 161—176 **17 Claims**

A process for the manufacture of a synthetic polymeric product consisting of a basic mass having a large number of endless threads embedded therein, which includes the steps of placing at least two polymeric components (e.g.. a polyamide and a polyester), while in the liquid state, side by side to form a single main stream, repeatedly dividing and multiplying the main stream to form a stream having a first multi-layer structure, superimposing at least a second multi-layer structure onto the first, with the layers of the second being at an angle to the first multi-layer structure and thereafter extruding the resulting stream through a die.



Apparatus for effecting this process includes a feed means for supplying at least two polymeric components side by side to a main channel. A first mixer is located in the main channel and has stationary guiding means by which the main stream may be repeatedly divided and doubled into a stream having a multi-layer structure. A second mixer similar to the first is positioned downstream thereof and is turned on its longitudinal axis through an angle of at least 10° so that the resulting stream has a second layered structure that is at an angle to the first layered structure formed in the first mixer. A die means is used for extruding the resulting stream.

ERRATUM

For Class 161—189 see:
Patent No. 3,577,314

3,577,309
METALLIC CONDUCTOR WITH CERAMIC FIBER INSULATION
Wesley W. Pendleton and George W. Ostrander, Muskegon, Mich., assignors to Anaconda Wire and Cable Company
Original application Nov. 2, 1964, Ser. No. 408,125, now Patent No. 3,464,836, dated Sept. 2, 1969. Divided and this application Apr. 23, 1969, Ser. No. 835,845
Int. Cl. B32b *15/14, 17/02;* **H01b** *3/08*
U.S. Cl. 161—196 **4 Claims**

In the manufacture of magnet wire with glass-fiber insulation the fibers are drawn from a crystallizable composition which is subsequently heat-treated to form ceramic fibers in situ, said ceramic fibers having at least fifteen weight percent B_2O and at least fifty weight percent of crystals of either spodumene, jadeite, or benitoite.

3,577,310

METHOD OF BONDING OLEFIN ELASTOMER TO TEXTILE FIBER AND PRODUCT OBTAINED

Luigi Torti and Guido Bertelli, Ferrara, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

No Drawing. Filed Oct. 10, 1967, Ser. No. 674,132
Claims priority, application Italy, Oct. 14, 1966, 28,859/66
Int. Cl. B32b *27/06*
U.S. Cl. 161—227 **11 Claims**

Process for bonding elastomeric saturated ethylene/alpha-olefin copolymer or ethylene/alpha-olefin/polyene terpolymer of low degree of unsaturation to natural or synthetic fibers or fabric. Involves treating the fibers or fabric with aqueous dispersion containing halogenated or chlorosulfonated ethylene/propylene/polyene terpolymer and phenol-formaldehyde resin; drying the treated fabric; placing the fabric in contact with a composition of the elastomer containing a vulcanizing agent; and heating the assembled product to vulcanize the elastomer.

3,577,311

FLOOR COVER

Richard W. Reiter, Plainfield, and Felix P. Liberti, Totowa Borough, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

No Drawing. Filed Aug. 4, 1969, Ser. No. 847,418
Int. Cl. B32b *27/04, 27/08, 27/12;* **C08f** *37/00, 45/04*
U.S. Cl. 161—254 **4 Claims**

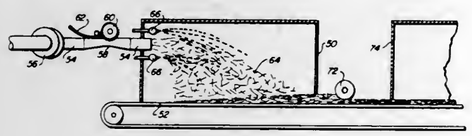
A flooring sheet including a felt backing layer and an upper surface plastisol layer bonded together with at least one tie-coat binder obtained from compositions which are based on selected copolymers, said copolymers containing moieties derived from vinyl acetate and at least one vinyl ester of an alpha-branched saturated aliphatic monocarboxylic acid.

3,577,312

FELTED FIBROUS WEB OR BATT

Otis R. Videen, St. Paul, and Donald E. Wiegand, Minneapolis, Minn., assignors to Conwed Corporation, St. Paul, Minn.

Filed Feb. 21, 1968, Ser. No. 707,147
Int. Cl. D21h *5/12*
U.S. Cl. 162—148 **10 Claims**



A felted fibrous web or batt having enhanced resiliency is produced with from 10% to 100% short fibers of chemically pulped wood. A resin binder is used which includes a cellulose reactive crosslinking reagent.

3,577,313

CONDENSATION PRODUCTS OF AMINES WITH EPIHALOHYDRINS

Justin C. Bolger, Needham, Hugh Evan McCollum, Cambridge, and Robert William Hausslein, Lexington, Mass., assignors to Amicon Corporation, Lexington, Mass.

No Drawing. Filed Oct. 16, 1967, Ser. No. 675,354
Int. Cl. D21d *3/00;* **D21h** *3/36*
U.S. Cl. 162—164 **7 Claims**

A condensation product, with an epihalohydrin, of a polyalkylene polyamine having the composition

$$NH_2—(A—NH)_n—H$$

in which A represents a straight chain alkylene group having 4 to 8 carbon atoms and *n* is a number from 2 to 6, and a second amino compound selected from the class consisting of ammonia; hydrazine; and the polyethylene polyamines, polypropylene polyamines, alkanolamines, and ethylamine alkanolamines having at least two hydrogen atoms attached to amino nitrogen, having a miscibility with water of at least 20% by weight of amino compound, and having a pK_a at 25° C. of at least about 9.0.

3,577,314

LAMINATED FUEL CELL CONTAINER

Theodore A. Evans, Akron, Ohio, asignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Mar. 24, 1969, Ser. No. 810,019
Int. Cl. B65g *3/00*
U.S. Cl. 161—189 **5 Claims**

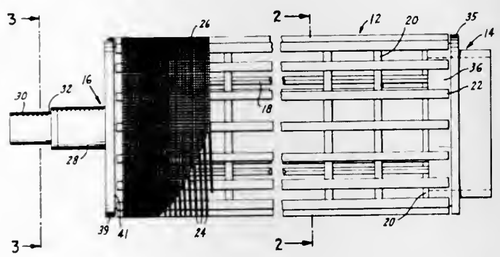
This invention relates to a method of preparing a container by forming a laminate comprising a polyamide fabric having a coating of a fluorocarbon composition thereon and having a polyamide film adhered to the fluorocarbon coating, the fluorocarbon composition being cured with an organic peroxy compound, an organic amine or a Schiff's base when compounded with metal oxides and iron oxide.

3,577,315

FORAMINOUS FORMING ROLLS FOR A PAPERMAKING MACHINE PRODUCED FROM SYNTHETIC RESINS

George H. Franklin, 734 Bliss Road, Longmeadow, Mass. 01106

Continuation-in-part of application Ser. No. 610,280, Jan. 19, 1967. This application Aug. 28, 1968, Ser. No. 767,023
Int. Cl. D21f *1/60, 3/10*
U.S. Cl. 162—210 **27 Claims**



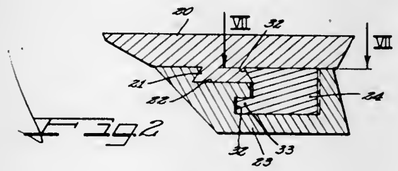
Forming rolls, such as the dandy rolls and the cylinder molds employed in the papermaking art, are fabricated from synthetic resins to reduce their weight and cost while increasing the corrosion resistance and ease of fabrication thereof to provide highly porous structures facilitating water passage. The structure of the invention comprises a hollow cylindrical foraminous body portion with head members at each end thereof to provide for mounting. The body portion is comprised of circumferentially extending support means spaced along the length thereof and a multiplicity of axially extending stiffening rods and top rods arranged about the circumference thereof, the support means in part lying radially outwardly of the stiffening rods, and the top rods lying radially outwardly of the support means. The winding wire and screen are supported upon the top rods, and may be synthetic resin if so desired.

3,577,316

REPLACEABLE DEFLECTOR BLADE STRUCTURE FOR A PAPERMAKING MACHINE

Andre G. Piette, Tracy, Quebec, Canada, assignor to Beloit Corporation, Beloit, Wis.

Filed Jan. 6, 1969, Ser. No. 789,130
Int. Cl. D21f *7/00*
U.S. Cl. 162—352 **5 Claims**



Arrangement for releasing a foil or deflector blade associated with a traveling Fourdrinier wire to enable the blade to be quickly replaced. The deflector blade, which constitutes a de-watering element, has a dovetail by which it is held on a rail by a dovetail recess formed by the rail and a slide positioned in the rail. Longitudinal position of the slide in the rail determines whether the dovetail recess is narrowed to grip the dovetail of the deflector blade and thereby hold it on the rail or is widened to release the dovetail and thereby permit easy removal of the blade from the rail.

3,577,317

CONTROLLED FUSION REACTOR

Cornelius H. Woods, Livermore, Calif., assignor to the United States of America as represented by the United States Atomic Energy Commission

Filed May 1, 1969, Ser. No. 820,750
Int. Cl. G21b *1/00*
U.S. Cl. 176—4 **8 Claims**

Controlled fusion reactor of the Astron type having a magnetic containment zone created by the interaction of the magnetic field of a high energy cylindrical layer of charged particles rotating in an axially symmetric magnetic field region in which an additional axial conductor introduces a shear magnetic field component to suppress instabilities which cause plasma loss.

3,577,318

PROCESS FOR MAKING 6-HYDROXY-3-KETO Δ^4-STEROIDS OF THE PREGNANE AND ANDROSTANE SERIES

Klaus Kieslich, Berlin, and Wolfgang Koch, Darmstadt-Arheilgen, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

No Drawing. Filed Jan. 28, 1970, Ser. No. 12,877
Claims priority, application Germany, Jan. 27, 1969, P 19 04 543.3
Int. Cl. C07c *167/14*
U.S. Cl. 195—51 **3 Claims**

6-hydroxy-3-keto-Δ^4-steroids of the pregnane or androstane series are made by fermenting a 3β-hydroxy or 3β-acyloxy-5,6-epoxy steroid of the pregnane or androstane series which is saturated in the A-ring with bacteria of the genus Flavobacterium of Pseudomonas, or enzymes thereof.

3,577,319

LARGE SCALE CULTIVATION OF *BORDETELLA PERTUSSIS* CELLS FOR VACCINE PRODUCTION

Peter Adams Nielsen, Ridgewood, Murray Sam Cooper, Dumont, and Ernest Robert Doyno, Woodcliff Lake, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 27, 1968, Ser. No. 732,063
Int. Cl. C12k *3/00*
U.S. Cl. 195—96 **6 Claims**

A *Bordetella pertussis* vaccine is prepared by deep tank cultivation using a seed grown in a biphasic culture system. The process eliminates cultivation on a blood-free seed agar, reduces the number of containers, and results in increased antigenicity of the phase I *Bordetella pertussis* vaccine.

3,577,320

DISTILLATION APPARATUS WITH VACUUM CONTROLLED BY RATE OF DISTILLATE FLOW

Forrest Thompson Randell, Glasgow, Scotland, assignor to G. & J. Weir Limited, Cathcart, Glasgow, Scotland

Filed Nov. 6, 1968, Ser. No. 773,885
Claims priority, application Great Britain, Nov. 24, 1967, 53,475/67
Int. Cl. B01d *3/42*
U.S. Cl. 202—160 **4 Claims**

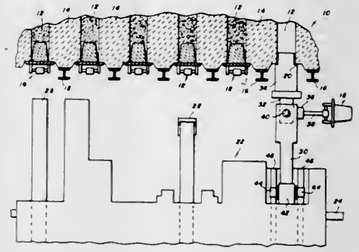
Distillation apparatus comprises a vessel having an evaporation section including a heating coil for the liquid to be distilled; and a condensing section including a vapour cooling coil; a heating medium supply to the heating coil; a pump or air ejector for creating a vacuum within the vessel; and a distillate outlet conduit from the condensing section. There are provided a sensor for sensing the rate of distillation of liquid, and a valve to regulate the vacuum within the vessel, the valve being operable by the sensor to regulate said vacuum in accordance with the rate of distillation whereby the rate of evaporation and consequently distillation are maintained at a desired value.

3,577,321

COMBINED COKE OVEN DOOR JAMB CLEANING APPARATUS AND DOOR HANDLING APPARATUS

Paul Schaten, Recklinghausen, Germany, assignor to Heinrich Koppers Gesellschaft mit beschrankter Haftung, Essen, Germany

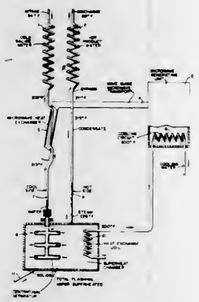
Filed Mar. 4, 1969, Ser. No. 804,143
Claims priority, application Germany, Mar. 7, 1968, P 16 71 333.0
Int. Cl. C10b *25/14, 33/08, 37/07*
U.S. Cl. 202—241 **4 Claims**



A coke oven pusher machine has a supporting arm extending therefrom and movable longitudinally toward and

away from the coke oven chamber. A connecting member is pivotally secured to the end of the supporting arm and has door jamb cleaning apparatus and door handling apparatus secured thereto in angular spaced relation to each other. A suitable drive means is provided to pivot the connecting member relative to the end of the supporting arm to position either the door jamb cleaning apparatus or the door handling apparatus in operative position with the coke oven door jamb. With this arrangement, the coke oven door jamb can be cleaned and the coke oven door replaced without moving the pusher machine.

3,577,322
MICROWAVE HEATING IN THE DESALINATION OF WATER
Stephen J. Nesbitt, 1111 Massachusetts Ave., Washington, D.C. 20005, and Edward M. Knapp, 951 N. Livingston St., Arlington, Va. 22205
Filed Dec. 3, 1968, Ser. No. 780,659
Int. Cl. B01d *1/18, 1/02, 3/08*
U.S. Cl. 203—11 **1 Claim**



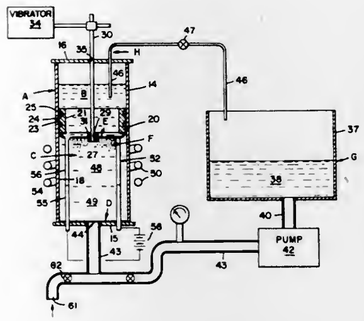
A system for the single stage flash distillation of saline or polluted water, combining the use of microwave output power as well as the waste heat in the microwave coolant as a source of heat and including centrifugal separation of particulate matter separated from the solute system by the change of state.

3,577,323
HIGH QUALITY SUBMASTERS
Marlowe A. Pichel, Altadena, Calif., assignor to Xerox Corporation
Original application Apr. 13, 1964, Ser. No. 359,280, now Patent No. 3,428,533, dated Feb. 18, 1969. Divided and this application Dec. 30, 1968, Ser. No. 806,765 (Filed under Rule 47(b) and 35 U.S.C. 118)
Int. Cl. C23b *7/06*
U.S. Cl. 204—7 **2 Claims**

This application relates to a replica metal master having a thin sheet of metal electroformed in a desired shape and a rigidizing structure for maintaining the optical accuracy of said sheet, said rigidizing structure being mounted on said sheet solely along the edges thereof.

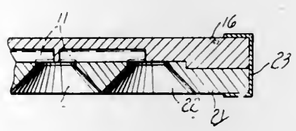
3,577,324
PROCESS OF COATING PARTICLES WITH METALS
James A. Patterson, Los Altos, Calif., assignor to Sondell Research Development Co., Palo Alto, Calif.
Filed Jan. 24, 1968, Ser. No. 700,053
Int. Cl. B01k *3/00;* **C23b** *5/60*
U.S. Cl. 204—20 **5 Claims**

A process and apparatus for simultaneously and uniformly plating numerous particles of small diameter. The apparatus comprises a column containing plating solution flowing vertically therethrough. Upper and lower transverse screens border the inside dimensions of the column interior of the plating solution and therebetween confine the particles being plated. Vibrational energy in the range of 20 to 20,000 cycles per second imparted to the plating solution strips the particles being plated of the gaseous



by-products of plating thereby preventing gas blinding of the plating reaction. Plating solution as vertically flowing through the plating segment moves those particles having low plating size and density into zones of the segment where plating occurs and permits those particles having the desired plating deposit thereon to settle into zones of the segment where plating is arrested.

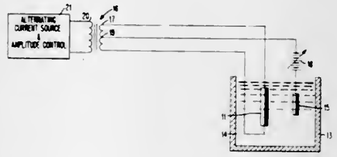
3,577,325
METHOD OF RECLAIMING GRAPHITE MASK
Albert R. Fairchild, Winston-Salem, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.
Filed May 29, 1968, Ser. No. 732,965
Int. Cl. C23b *1/00, 5/48*
U.S. Cl. 204—24 **2 Claims**



A pallet and a mask for use in the manufacture of thin film components are machined from a block of high density fine grain pressed graphite to the desired size and shape. The graphite pallet and mask are plated with a flash of copper so that the copper may be dissolved or reacted with an acid to release the layer of precious metals which accumulate during repeated use of the pallet and mask. Thin film substrates are placed in the pallet and covered by the mask. In use, the assembled pallet and

mask are inverted such that gravity forces the substrates against the mask to insure that the metal is deposited only on the desired areas of the substrate.

3,577,326
PROCESS FOR MAKING A MAGNETIC DATA STORAGE ELEMENT
Lynn C. Liebschutz, Endicott, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed July 12, 1968, Ser. No. 744,401
Int. Cl. C23b *5/32;* **C23c** *3/00;* **H01f** *41/14*
U.S. Cl. 204—43 **2 Claims**



A process of making a magnetic material in the form of a film on a conductive cylindrical substrate comprises applying an alternating current to the substrate to generate an alternating orienting magnetic field circumferentially about the substrate. The orienting magnetic field strength is adjusted to produce an isotropic magnetic layer on the substrate or at higher intensities produces films with circumferentially closed easy axis. The alternating current is applied concurrently with deposition of ferromagnetic films from an electrolytic or electroless ferromagnetic bath solution. In an electroless deposition system and the electrolytic system, a direct current applied to electroplate or to initiate and sustain deposition is isolated from the alternating orienting field energization. The alternating orienting current may be sinusoidal but is preferably a square wave and has a zero D-C component.

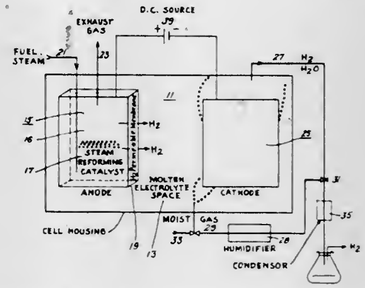
3,577,327
METHOD AND COMPOSITION FOR ELECTROPLATING CADMIUM (B)
Tibor Joachim, Vernon, and Merton M. Beckwith, Tolland, Conn., assignors to Conversion Chemical Corporation, Rockville, Conn.
No Drawing. Filed Feb. 19, 1969, Ser. No. 800,725
Int. Cl. C23b *5/10, 5/12, 5/46*
U.S. Cl. 204—50 **15 Claims**

An aqueous bath for producing bright, adherent cadmium electrodeposits upon metallic surfaces contains cadmium ion, chloride ion, a nicotinic acid and an aminopolyacetic acid type of chelating agent. The bath is highly conductive and operable at low voltages, and has a pH which is acidic or slightly alkaline.

3,577,328
METHOD AND BATH FOR ELECTROPLATING TIN
George B. Rynne, Rockville, and Merton M. Beckwith, Tolland, Conn., assignors to Conversion Chemical Corporation, Rockville, Conn.
No Drawing. Filed Nov. 7, 1968, Ser. No. 774,177
Int. Cl. C23b *5/46*
U.S. Cl. 204—54 **25 Claims**

An aqueous bath for electroplating tin upon various conductive substrates contains stannous ion, sulfate radical, an imidazoline derivative and a heterocyclic aldehyde. The bath is highly acid and is operable to produce smooth adherent deposits over a wide range of current densities and deposits of spectral brightness with the optimum formulations.

3,577,329
PROCESS FOR THE PRODUCTION OF HIGH PURITY HYDROGEN
Harold Shalit, Drexel Hill, Pa., assignor to Atlantic Richfield Company, Philadelphia, Pa.
Filed Mar. 17, 1969, Ser. No. 807,865
Int. Cl. C01b *13/04;* **H01m** *27/20*
U.S. Cl. 204—60 **9 Claims**



An improved process and apparatus for the production of hydrogen of high purity whereby a carbonaceous fuel is reformed to produce hydrogen and said hydrogen is recovered economically from said reforming operation through the use of an electrolytic process using chemical energy of the reforming process to reduce electrical energy needed and wherein a moist gas is added to the electrolyte to facilitate the electrolytic recovery of hydrogen at the cathode.

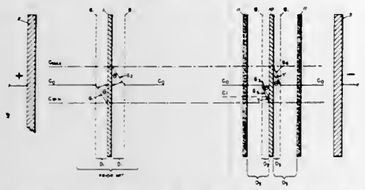
3,577,330
PROCESS FOR PRODUCING ELECTROREFINED NICKEL HAVING CONTROLLED SIZE
Burton Bower Knapp, Allendale, N.J., and Leander Ernest Cupp, Port Colborne, Ontario, Canada, assignors to The International Nickel Company, Inc., New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 338,309, Jan. 17, 1964. This application Nov. 17, 1967, Ser. No. 683,801
Int. Cl. C22d *1/14;* **C23b** *7/08*
U.S. Cl. 204—112 **7 Claims**

An improved process for producing electrorefined nickel cathode material of controlled dimension and substantial thickness wherein the nickel is deposited upon a substantially flat, permanent metal cathode mandrel such as stainless steel, and having conductive islands of controlled size defined on the surface thereof, e.g., by the use of interconnecting lines of nonconductive resist, from a nickel electrorefining catholyte containing controlled amounts of sulfur dioxide and a levelling agent to facilitate adherence of the electrodeposited nickel upon the mandrel surface by controlling the stress level therein to a tensile value not exceeding about 6,000 pounds per square inch and thereafter stripping the nickel deposit from the mandrel to recover electrodeposited nickel in sizes corresponding to the original areas of the conductive islands and to recover the mandrel in a condition suitable for further plating.

3,577,331
APPARATUS AND PROCESS FOR EFFECTING CHANGES IN SOLUTION CONCENTRATIONS
Robert E. Lacey, Homewood, Ala., and Milton S. Mintz, Stamford, Conn., assignors to the United States of America as represented by the Secretary of the Interior and Southern Research Institute
Filed June 8, 1967, Ser. No. 645,571
Int. Cl. B01d *13/02*
U.S. Cl. 204—180 **16 Claims**

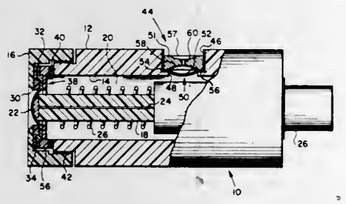
The present invention relates to an apparatus and a process for effecting changes in solution concentrations wherein a component of the solution is passed through a

separatory membrane which is selectively permeable to that component. This invention enhances the efficiency of all existing membrane separation processes by reducing the thickness of the boundary layers formed at the membrane-solution interface. The reduction in thickness is



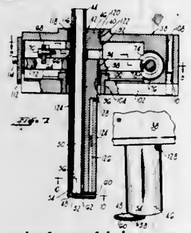
accomplished by placing in spaced relationship to the selectively permeable membrane a second porous membrane permeable to the solution. While the apparatus and process are useful in all membrane separation systems, particular utility is found in electrically driven or pressure-driven desalination systems.

3,577,332
POLAROGRAPHIC CELL
Joe A. Porter, Whittier, and Steuart L. Couch, Santa Ana, Calif., assignors to Beckman Instruments, Inc.
Filed July 12, 1967, Ser. No. 652,745
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 **4 Claims**



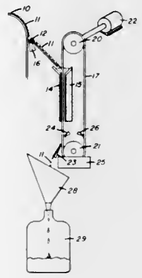
A cell for polarographic analysis of the type employing a pair of electrodes joined by an electrolyte and separated from the sample medium by a selectively permeable membrane. Pressure compensation is provided for the cell by employing an ion impermeable barrier which closes a passage leading to the eletrolyte reservoir in the cell so that contaminants outside of the cell cannot reach the electrolyte reservoir. The barrier has a sensitivity to pressure changes greater than that of the membrane so that the spacial relationship between the membrane and the sensing electrode of the cell is not influenced by changing pressure conditions.

3,577,333
APPARATUS FOR ELECTROCHEMICAL REMOVAL OF MATERIAL FROM AN ARTICLE
Edward R. Derrough, South Bend, Ind., assignor to The Bendix Corporation
Filed Sept. 24, 1968, Ser. No. 761,966
Int. Cl. B23p *1/04, 1/12*
U.S. Cl. 204—212 **4 Claims**



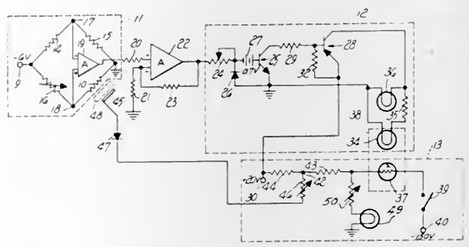
An electrochemical machining apparatus having a hollow electrode tool with a working face for eroding a core of material from a workpiece in response to a rotational input.

3,577,334
APPARATUS FOR ELECTROLYTIC RECOVERY OF A METAL FROM A SOLUTION
Charles L. Graham and Harlow R. Brigham, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 14, 1967, Ser. No. 690,621
Int. Cl. B01k *3/10;* **C22d** *1/02, 1/12*
U.S. Cl. 204—223 **18 Claims**



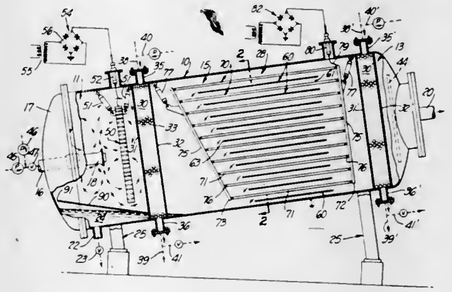
A metal is recovered from a solution in which the metal is present in ionic form by supporting a thin moving layer of the solution in contact with an electrode, impressing an electric potential across the moving layer, and mixing the solution within the layer as it travels past the electrode so as to replenish metal ions as they are depleted from immediately adjacent the electrode surface at which plating of the metal occurs. Apparatus for carrying out this method includes electrode means and a moving belt which supports the thin layer of solution in contact with the electrode means, the movement of the belt acting to ensure flow of the solution past the electrode and to simultaneously agitate the moving layer to effect mixing of the solution within the layer. The method and apparatus are of particular utility in the recovery of silver from viscous fixing solutions employed in photographic processing.

3,577,335
FEEDBACK CIRCUIT FOR ANODIZING THIN-FILM RESISTORS
Frank H. Blitchington, Jr., Greensboro, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.
Filed May 9, 1968, Ser. No. 727,948
Int. Cl. B01k *3/00*
U.S. Cl. 204—228 **6 Claims**



A thin-film resistor, which is to be anodized to increase its resistance to a preselected value is connected to one arm of a bridge circuit. As the resistor is being anodized, an imbalance in the bridge drives a monitor circuit which controls a variable resistance in series with a supply of anodizing voltage. As the thin-film resistor being anodized approaches the preselected value, the bridge becomes more nearly balanced and the variable resistor increases in value to interrupt the flow of anodizing current.

3,577,336
ELECTRIC TREATER FOR TREATING JET FUEL AND OTHER DISPERSIONS
William L. Shirley, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.
Filed Aug. 23, 1968, Ser. No. 754,847
Int. Cl. B03c *5/02*
U.S. Cl. 204—302 **23 Claims**



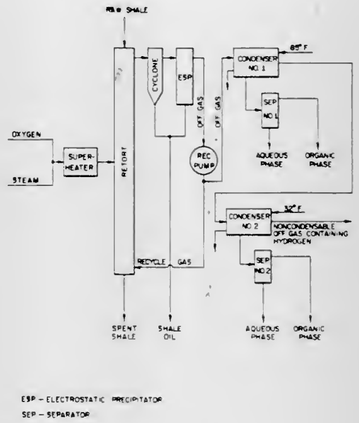
An electric treater for removing dispersed materials from oil flowing through electric fields in side-by-side flow passages that are other than vertical. Grid electrodes having side-by-side rods are disposed in the central planes of the flow passages. With such or other electrode configurations in an electric treating chamber, oil flows into or from the latter through a space packed with masses, usually solids, that can be continuously or periodically replaced. The masses may have surface properties or coatings facilitating the separation of the dispersed material from the oil or such masses or materials coating or impregnating same may be reactive with some component of the oil.

3,577,337
SOLVENT EXTRACTION OF COAL
Theodore Kessler, Andrew G. Sharkey, Jr., Joseph Malli, Jr., and Robert A. Friedel, Pittsburgh, Pa., assignors to the United States of America as represented by the Secretary of the Interior
No Drawing. Filed Mar. 11, 1970, Ser. No. 18,693
Int. Cl. C10g *1/04*
U.S. Cl. 208—8 **7 Claims**

Coal is extracted in quinoline by treatment of a coal-quinoline slurry with ultrasonic irradiation at ambient temperature. The quinoline may then be removed from the solubilized coal fraction by conversion to a water-soluble quinoline salt. The solubilized fraction may be used for production of gasoline, aromatic chemicals, carbon black, electrode carbons, low-sulfur and -ash fuels for power plants, etc.

3,577,338
PROCESS FOR RECOVERY OF OIL FROM OIL SHALE SIMULTANEOUSLY PRODUCING HYDROGEN
Phillip H. Gifford II, Carbondale, Colo. (1824 K 4/10 Road, Fruita, Colo. 81521)
Filed Feb. 19, 1969, Ser. No. 800,594
Int. Cl. C10b *53/06*
U.S. Cl. 208—11 **11 Claims**

A process for retorting oil shale and simultaneously producing hydrogen as a by-product with high yields of both oil and hydrogen, the process comprising continuously passing oil shale through a combustion zone in a retort while continuously introducing steam and oxygen into the combustion zone, removing spent shale below the



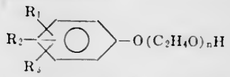
combustion zone and recovering oil and hydrogen from the retort off gas from the combustion zone. Hydrogen is produced by the reaction of carbon containing material with steam.

3,577,339
FILTRATION METHOD OF SEPARATING LIQUIDS FROM EXTRANEOUS MATERIALS
Justus N. Baird, Jr., Kingston, and James S. Johnson, Kurt A. Kraus, and Joseph J. Perona, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission
No Drawing. Continuation of application Ser. No. 718,231, Apr. 2, 1968. This application Jan. 29, 1970, Ser. No. 7,387
Int. Cl. B01d *13/00*
U.S. Cl. 210—23 **3 Claims**

A cross flow filtration method of separating a liquid from extraneous material comprising establishing a filtering medium comprising a bed of fine particles dispersed on a porous substrate and forcing a liquid across said filtering medium under conditions whereby a portion of said liquid passes through said filtering medium.

3,577,340
METHOD FOR DISPERSING OIL SPILLS ON WATER
Stanley C. Paviak, Shaler Township, Warren K. Porter, Jr., Richland Township, Allegheny County, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed Apr. 16, 1970, Ser. No. 29,295
Int. Cl. B01d *17/04*
U.S. Cl. 210—42 **9 Claims**

A method for dissipating oil spills in water by dispersing the spilled oil with a novel alkylphenol ethoxylate having the structural formula



wherein n is an integer from about 5 to about 25, R_1 is an alkyl group having at least 20 carbon atoms and R_2 and R_3 are independently selected from said alkyl group and hydrogen; and mixtures of the same.

3,577,341

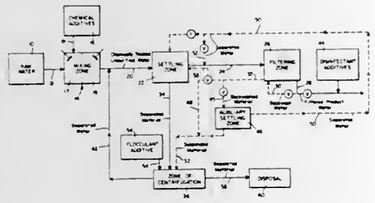
WATER TREATMENT

Frederick W. Keith, Jr., Gladwyne, Everett M. Jones, Ardmore, and Joseph R. Townsend, Jr., West Chester, Pa., assignors to Pennwalt Corporation

Filed Oct. 18, 1968, Ser. No. 768,848

Int. Cl. C02b *1/20*

U.S. Cl. 210—53 **13 Claims**



In water treatment, immediately following treating with chemicals and settling of sedimented material, the latter no longer need be returned as a pollutant to a water course, or otherwise disposed of. Rather, the sedimented material is centrifugally concentrated for convenient disposal in compact form and the water separated therefrom may be reprocessed.

3,577,342

FIRE-RESISTANT FINISH FOR TEXTILES COMPRISING ZINC FLUOROBORATE

Louis Isadore Fidell, Bound Brook, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Continuation-in-part of application Ser. No. 647,603, June 21, 1967, which is a continuation-in-part of application Ser. No. 457,209, May 19, 1965. This application Sept. 2, 1969, Ser. No. 854,750

Int. Cl. C09k *3/28*

U.S. Cl. 252—8.1 **4 Claims**

Fire retardant finishing compositions, especially useful for synthetic fibers, incorporating zinc fluoroborate and emulsification and other additives to maintain the desirable hand and feel of the textile material.

3,577,343

DIBENZAZEPINE COMPOUNDS AS STABILIZER FOR OXIDIZABLE ORGANIC COMPOSITIONS

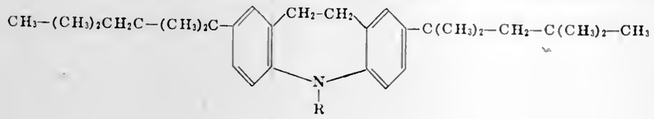
Hans Jakob Peterli, Fullingsdorf, Switzerland, and Donald Richard Randell, Stockport, England, assignors to Geigy Chemical Corporation, Greenburgh, N.Y.

No Drawing. Division of application Ser. No. 588,225, Oct. 20, 1966, now Patent No. 3,475,412, which is a continuation of application Ser. No. 523,539, Jan. 28, 1966, which is a continuation-in-part of application Ser. No. 424,210, Jan. 8, 1965, which in turn is a continuation-in-part of application Ser. No. 158,169, Dec. 8, 1961. This application Oct. 27, 1969, Ser. No. 870,959

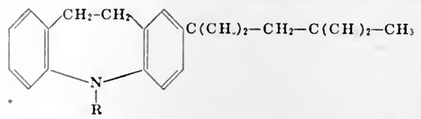
Int. Cl. C10m *1/32;* **C08f** *45/60*

U.S. Cl. 252—51.5 **7 Claims**

Oxidizable organic materials are rendered less susceptible to oxidative deterioration by incorporation of an effective amount of a compound from the group of



and an N-substituted azepine compound of the formula



in which formulas R is a member selected from the group consisting of hydrogen, alkyl having from 1 to 12 carbon atoms, hydroxy-substituted lower alkyl, phenyl-substituted lower alkyl, benzoyl and alkanoyl with 1 to 8 carbon atoms.

3,577,344

FIBROUS THERMAL INSULATION AND METHOD OF MAKING SAME

Zane L. Ardary, Oak Ridge, Andrew W. Maxey, Knoxville, and Carl D. Reynolds, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 29, 1969, Ser. No. 794,980

Int. Cl. C04b *43/02;* **E04b** *1/76;* **F16l** *59/00*

U.S. Cl. 252—62 **11 Claims**

Lightweight, high-temperature, thermal insulating material is prepared by molding an admixture or water slurry of small-diameter fibers of a refractory or carbonaceous material and a carbonizable binder consisting of starch particulates. The molded admixture is heated sufficiently to gelatinize the starch, then dried, and thereafter heated sufficiently in an inert atmosphere to pyrolyze the starch for effectively bonding together the fibers. The thermal insulating material is of a density less than 10 lbs./ft.^{3} and has a thermal conductivity of less than about 1 B.t.u.-in./hr.-° F.-ft.^{2} at a temperature of 1400° F.

3,577,345

SOLID XEROGRAPHIC DEVELOPER

Burton B. Jacknow and Joseph H. Moriconi, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

No Drawing. Filed June 5, 1967, Ser. No. 643,394

Int. Cl. G03g *9/02*

U.S. Cl. 252—62.1 **9 Claims**

A finely-divided low melting toner comprising a colorant, a thermoplastic resin comprising a vinyl resin, a solid metal salt of a fatty acid, and a solid additive having a melting point between about 115° F. to about 270° F. comprising a benzoate, a sulphonamide or a polychlorinated polyphenyl compound.

3,577,346

INSULATED ELECTRICAL CONDUCTORS HAVING CORONA RESISTANT POLYMERIC INSULATION CONTAINING ORGANO METALLIC COMPOUNDS

James J. McKeown, Mahtomedi, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

No Drawing. Continuation-in-part of application Ser. No. 555,695, June 7, 1966. This application Nov. 14, 1968, Ser. No. 775,958

Int. Cl. C08f *45/62;* **C08g** *51/62;* **H01b** *3/28*

U.S. Cl. 252—63.5 **49 Claims**

Insulated electrical conductors having improved corona resistance comprising a metal conductor surrounded by a major portion of a dielectric polymer containing intermixed therewith a minor amount of an organo-metallic compound of a metal selected from silicon, germanium, tin, lead, phosphorous, arsenic, antimony, bismuth, iron, ruthenium and nickel and a method for the preparation of the insulated electrical conductors.

ERRATUM

For Class 252—73 see:
Patent No. 3,577,361

3,577,347

WATER-SOLUBLE SCOURING COMPOSITION

John Alexander Monick, 102 Jasper Ave., Teaneck, N.J. 07666

No Drawing. Filed Apr. 3, 1968, Ser. No. 718,325

Int. Cl. C11d *7/56*

U.S. Cl. 252—99 **4 Claims**

A stable nongritty cleanser composition comprising a detergent, bleach, and a water soluble salt, said salt having less than 6 molecules of water of hydration.

3,577,348

TRICHLOROTRIFLUOROETHANE WATER EMULSION SYSTEM

John Joseph Clementson, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed May 1, 1968, Ser. No. 725,897

Claims priority, application Great Britain, May 8, 1967, 21,221/67, 21,222/67; Aug. 14, 1967, 37,321/67, 37,719/67

Int. Cl. C11d *1/12, 7/50;* **B01f** *17/10*

U.S. Cl. 252—153 **16 Claims**

Cleaning compositions containing a fluorochlorohydrocarbon solvent and a sodium, ammonium or amine salt of a monosulphonic acid derivative of a di-ester of succinic acid, optionally also containing a non-ionic surfactant, ammonia, water and a stabilizer for the said solvent.

3,577,349

COMPOSITION FOR DESTROYING HARDENED CEMENTITIOUS MIXTURES

Robert Glenn Haines, South Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Jan. 31, 1969, Ser. No. 795,709

Int. Cl. C09d *9/00;* **C11d** *7/05;* **C23g** *5/02*

U.S. Cl. 252—170 **8 Claims**

A composition for destroying hardened cementitious mixtures comprising methyl acetoacetate and water. A method for destroying hardened cementitious mixtures utilizing said composition is also covered.

3,577,350

EUROPIUM AND MANGANESE ACTIVATED SODIUM OR POTASSIUM ALUMINATE PHOSPHORS

Robert L. Amster, Great Neck, N.Y., assignor to General Telephone & Electronics Laboratories, Incorporated

Filed Nov. 27, 1968, Ser. No. 786,804

Int. Cl. C09k *1/68*

U.S. Cl. 252—301.4 **6 Claims**

A phosphor system consisting of an alkali metal β-alumina activated by divalent europium or by divalent europium together with divalent manganese. These phosphors are photoluminescent and cathodoluminescent and are suitable for use in fluorescent lamps or cathode ray tube screens.

3,577,351

METHOD FOR THE RECOVERY OF RARE EARTH OXIDES

Robert E. Dodds, Wysox, Pa., assignor to Sylvania Electric Products Inc.

No Drawing. Filed Jan. 30, 1969, Ser. No. 795,346

Int. Cl. C09k *1/10*

U.S. Cl. 252—301.4 **10 Claims**

A process is disclosed that is suitable for recovering rare earth oxide phosphors from an impure material containing rare earth oxides contaminated with other phosphors used in color television cathode ray tubes. The process comprises: heating the impure material to remove volatile material, forming an aqueous material containing the impure rare earth material, adjusting the temperature of the mixture to about 80° C., maintaining the pH of the mixture at from about 3 to about 5 to dissolve the rare earth oxides, separating the solids from the mixture to form a liquid phase containing the rare earth values and precipitating the rare earth values and converting said rare earth values to rare earth oxide phosphors.

3,577,352

TEMPERATURE INDICATING DEVICE OF DISPERSION FILTER ADJUSTED TO PRODUCE COLOR CHANGES NEAR 0° C.

Jan Bol, Kelkheim, Taunus, Germany, assignor to Battelle-Institute e.V., Frankfurt am Main, Germany

No Drawing. Filed May 17, 1968, Ser. No. 730,201

Claims priority, application Great Britain, May 17, 1967, 58,798/67

Int. Cl. G01k *11/16, 11/18*

U.S. Cl. 252—408 **8 Claims**

A temperature indicating device using a Christiansen filter wherein the refractive indices and dispersion values of the solid and the fluid phase are so adjusted as to produce color changes near the freezing point.

3,577,353

PREPARATION OF A COGELLED CATALYST OF ALUMINA AND A GROUP VI HYDROGENATING COMPONENT

Robert J. White, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Nov. 22, 1968, Ser. No. 778,332

Int. Cl. B01j *11/34, 11/40*

U.S. Cl. 252—465 **2 Claims**

A hydrofining catalyst is prepared by cogelation of hydrous alumina and a Group VI metal or metal compound, washing said gel to remove occluded salts and then contacting the washed gel with an organic solvent before the gel is dried and calcined. This contacting step, which may be carried out with methanol or ethanol, serves to extract water from the hydrous gel and thus provides less shrinkage of the gel after final drying.

3,577,354

MAGNESIUM CHROMIUM FERRITE CATALYST

William L. Kehl, Indiana Township, Allegheny County, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Division and continuation-in-part of application Ser. No. 493,222, Oct. 5, 1965. This application June 27, 1969, Ser. No. 837,376

Int. Cl. B01j *11/06, 11/32*

U.S. Cl. 252—468 **13 Claims**

A hydrocarbon conversion catalyst comprising magnesium, chromium, iron and oxygen in a magnesium chromium ferrite spinel-type structure.

3,577,355

RESISTOR COMPOSITION

Jack F. Blum, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.

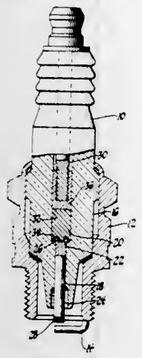
Filed Dec. 21, 1967, Ser. No. 692,485

Int. Cl. H01t *13/36;* **H01b** *1/02*

U.S. Cl. 252—512 **6 Claims**

An improved resistor composition for use in resistor spark plugs and other electrical devices is disclosed. The resistor composition contains a metal powder taken from the group consisting of zinc, antimony and tellurium in

addition to the conventional resistor composition ingredients. The metal, for example, zinc, causes the resistor



mass to bond tightly to the center electrode head in the spark plug insulator centerbore.

3,577,356
HIGHLY FLUORINATED POLYMERS
Floyd D. Trischler and Jerome Hollander, San Diego, Calif., assignors to Whittaker Corporation, Los Angeles, Calif.
No Drawing. Filed Feb. 23, 1968, Ser. No. 707,440
Int. Cl. C08g *23/00, 33/00*
U.S. Cl. 260—2 **7 Claims**

This patent describes novel hydroxy containing polyethers which are prepared by the base polymerization of 2-hydro-perhaloisopropyl alcohols having the formula

$$CF_3-\overset{\overset{OH}{|}}{C}H-CF_2X$$

wherein X is fluorine, chlorine, bromine or iodine.

3,577,357
SELECTIVELY SULFONATED BLOCK COPOLYMERS
De Loss E. Winkler, Orinda, Calif., assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed Nov. 29, 1968, Ser. No. 780,179
Int. Cl. C08j *1/34*
U.S. Cl. 260—2.2 **7 Claims**

Block copolymers exhibiting water absorption characteristics indicating their use in water purification membranes and the like comprise block copolymers having sulfonated polyvinyl arene blocks and alpha-olefin elastomeric blocks, the sulfur content of the copolymers varying from about 1% by weight to one sulfonated radical per monovinyl arene unit.

3,577,358
ORGANIC ISOCYANATE-LIGNIN REACTION PRODUCTS AND PROCESS
Thomas R. Santelli, Sylvania, and Robert T. Wallace, Toledo, Ohio, assignors to Owens-Illinois, Inc.
No Drawing. Continuation-in-part of application Ser. No. 846,822, Oct. 16, 1959. This application Feb. 10, 1967, Ser. No. 615,072
Int. Cl. C08g *22/44*
U.S. Cl. 260—2.5 **16 Claims**

New polymeric materials, such as synthetic resins, foamed cellular synthetic resins, and the like, are formed by reacting an organic polyisocyanate with lignin, preferably in the presence of varying amounts of catalysts, plasticizers, emulsifiers, solvents, and co-reactants, depending upon the desired characteristics of the final product. Such product has repeating urethane linkages in the molecule. Products of the invention are suitable for many uses, among which uses are as foams, plastics, adhesives, etc.

3,577,359
METHOD OF RETICULATING NYLON MATERIALS
Frank E. Carevic and Theodore H. Fairbanks, West Chester, Pa., assignors to FMC Corporation, Philadelphia. Pa.
Filed Feb. 5, 1968, Ser. No. 703,068
Int. Cl. C08g *53/08, 53/20*
U.S. Cl. 260—2.5 **7 Claims**

A foamed nylon material, formed of contacting cells which provide a skeletal structure of interconnected strands with membranes partitioning contiguous cells and joined to the skeletal structure, is exposed to a solution of a strong acid and a non-aqueous solvent to remove the cell membranes, leaving the skeletal structure of nylon material which is suitable, for example, as a filter.

ERRATUM

For Class 260—2.5 see:
Patent No. 3,577,554

3,577,360
PROCESS FOR PRE-EXPANDING POLYMER BEADS
Richard H. Immel, Sewickley, Pa., assignor to Sinclair-Koppers Company
Filed Oct. 7, 1968, Ser. No. 765,342
Int. Cl. B29d *1/00;* **B29h** *7/20*
U.S. Cl. 264—53 **5 Claims**

An apparatus and process are provided for expanding polymeric particles to a predetermined density, which particles are subject to further expansion. Agitated particulate expandable polymer is heated in a dry atmosphere in a closed vessel, under vacuum, to a predetermined density. To achieve ultra-low density expandable prepuff, a coolant such as water is introduced into the closed vessel after the predetermined density is reached, but prior to the release of the vacuum. Following release of the vacuum, the beads are removed from the closed vessel and may be molded directly, without any aging period such as that necessary following steam pre-expansion.

3,577,361
SYNTHETIC POWER TRANSMISSION FLUIDS
William C. Hammann, Creve Coeur, and Robert M. Schisla, Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Filed May 22, 1968, Ser. No. 731,254
Int. Cl. C09k *3/00*
U.S. Cl. 252—73 **6 Claims**

An improved method of transmitting power in hydraulically-operated mechanisms which comprises using as the operative fluid certain tetraalkyl substituted alkylene-linked dicyclohexyl compounds.

3,577,362
METHOD OF MANUFACTURING URETHANE FOAM BY THE USE OF POLY(VINYL-ALKOXY SILANES)
Kihachi Tamura, Musashino-shi, and Isao Nakajima and Kaname Inoue, Tokyo, Japan, assignors to Shin-Etsu Chemical Industry Co., Ltd., Tokyo, Japan
No Drawing. Original application Jan. 29, 1964, Ser. No. 341,123, now Patent No. 3,461,148, dated Aug. 12, 1969. Divided and this application Oct. 30, 1968, Ser. No. 785,431
Claims priority, application Japan, Jan. 29, 1963, 38/3,960; Jan. 31, 1963, 38/4,970, 38/4,971; Feb. 1, 1963, 38/5,069
Int. Cl. C08g *22/46, 53/08*
U.S. Cl. 260—2.5 **8 Claims**

A process for manufacturing a polyoxyalkylene polyvinylsilane by condensing a polyoxyalkylene compound

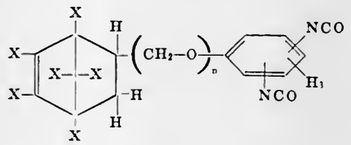
with a vinylsilane and polymerizing the resulting condensate in the presence of the catalyst selected from organic peroxides and organic azo compounds, the polyoxyalkylene polyvinylsilanes so produced and use of the polyoxyalkylene polyvinylsilane as a surfactant in the manufacture of polyurethane foam.

3,577,363
CELLULAR PLASTICS MATERIAL CONTAINING POLYSTYRENE AND A PROCESS FOR ITS MANUFACTURE
Olof Walter Henry Klug, Stockholm, Sweden, assignor to AB Electrolux, Stockholm, Sweden
No Drawing. Filed June 20, 1969, Ser. No. 835,214
Claims priority, application Sweden, July 5, 1968, 9,319/68
Int. Cl. C08f *47/10;* **C08g** *53/10*
U.S. Cl. 260—2.5 **10 Claims**

A material consisting of closed cells of polystyrene which are surrounded by cured urea formaldehyde resin is produced in the following manner: Small, enexpanded polystyrene particles are mixed with urea formaldehyde resin in a liquid medium; the urea formaldehyde resin is then converted to a foam and cured in the form of this foam without any substantial expanding of the polystyrene particles; after the curing step, the polystyrene particles are expanded by heating.

3,577,364
COMPOSITIONS OF MATTER
Daniel S. Raden, Chicago, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.
No Drawing. Original application Oct. 22, 1965, Ser. No. 502,552, now Patent No. 3,509,199, dated Apr. 28, 1970. Divided and this application June 17, 1968, Ser. No. 761,358
Int. Cl. C08g *22/24, 22/26, 22/44*
U.S. Cl. 260—2.5 **6 Claims**

The subject matter of this application is a new flame retardant rigid cellular plastic foam prepared from (5-methylene - 1,2,3,4,7,7 - hexachlorobicyclo[2.2.1] - 2-heptenyl)-2,4-diisocyanatophenyl ether, or compounds generically defined as



wherein X is halogen and n is 0 or 1.

3,577,365
NOVEL BLENDS OF CHLORINATED CARBOXYL GROUP CONTAINING POLYMERS AND ETHYLENE-VINYL ACETATE COPOLYMERS
Paul D. Folzenlogen and Hugh J. Hagemeyer, Jr., Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Feb. 7, 1969, Ser. No. 797,703
Int. Cl. C08f *29/12*
U.S. Cl. 260—4 **12 Claims**

Compositions comprising blends of chlorinated carboxyl group containing polymers and ethylene-vinyl acetate copolymers. These compositions provide tough, flexible coatings having excellent adhesion to various substrates. These coatings have good resistance to chemical and solvent attack and embrittlement on aging and are useful in the protective coatings field.

3,577,366
9,10-BRIDGED ANTHRACENE COMPOUNDS
Bruce H. Klanderman, Rochester, and Jan W. H. Faber, Hilton, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Application Feb. 17, 1967, Ser. No. 616,789, now Patent No. 3,457,235, which is a continuation-in-part of application Ser. No. 530,381, Feb. 28, 1966. Divided and this application Mar. 28, 1969, Ser. No. 811,655
Int. Cl. C07c *31/14*
U.S. Cl. 260—618 **8 Claims**

New 9,10 - bridged anthracene compounds, such as 9,10 - bis(hydroxymethyl)triptycene and 9,10 - dihydro-9,10 - bis(hydroxymethyl) - 9,10 - ethanoanthracene improve certain properties of polyesters prepared by polymerization of a dicarboxylic acid, such as terephthalic acid, and an alkylene glycol, such as ethylene glycol, when incorporated in the polymerization mixture. The 9,10-bis(acyloxyalkyl) - 9,10 - bridged anthracene compounds from which the anthracene compounds used in preparing the polyesters are prepared are new compounds.

3,577,367
FOUNDRY SAND COMPOSITIONS CONTAINING GRAFT COPOLYMERS OF ACRYLIC ACID WITH METHYL CELLULOSE
William J. Lang, Libertyville, Ill., assignor to International Minerals & Chemical Corporation
No Drawing. Filed Sept. 4, 1968, Ser. No. 757,469
Int. Cl. C08f *29/36;* **B22c** *1/26*
U.S. Cl. 260—17 **15 Claims**

A sand core and mold composition for use in casting metals comprising foundry sand, clay, water and from about 0.0025% to about 1% by weight of a water-soluble graft copolymer of acrylic acid and a minor amount of methyl cellulose, including water-soluble salts thereof.

3,577,368
BARK FIBER AS A REINFORCING AND STABILIZING AGENT FOR HIGH TEMPERATURE MOLDING THERMOPLASTICS
Hubert E. Hendrickson and Charles N. McCain, Longview, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.
No Drawing. Filed Mar. 8, 1967, Ser. No. 621,436
Int. Cl. C08f *29/10, 45/18*
U.S. Cl. 260—17.4 **4 Claims**

The invention comprises the use of Douglas fir bark fiber as a stabilizer for polypropylene molding compounds. The bark fibers may be incorporated into the molding compound by simple blending methods to provide a homogeneous molding premix, yet provide superior physical properties to the article of manufacture as well as improved heat stability.

3,577,369
BARK FIBER AS A DISPERSING AGENT FOR HIGH TEMPERATURE MOLDING THERMOPLASTICS
Hubert E. Hendrickson and Charles N. McCain, Longview, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.
No Drawing. Filed Mar. 8, 1967, Ser. No. 621,420
Int. Cl. C08f *45/18*
U.S. Cl. 260—17.4 **4 Claims**

The invention comprises the use of Douglas fir bark fiber as a dispersing agent for reinforced polypropylene molding compound which can be used at elevated molding conditions. The bark fiber may be incorporated into the reinforced molding compound by simple blending methods to provide a homogeneous molding premix, yet provide the article manufactured and produced thereby with the reinforcing material dispersed uniformly therein.

ERRATUM

For Class 260—17.4 see:
Patent No. 3,577,555

3,577,370
MODIFIER FOR PHENOLIC RESINS
Anthony J. Castro, Oak Park, Frederick S. Marsh, Chicago, Layton E. Kinnney, Villa Park, and Frank J. Fischl, Chicago, Ill., assignors to Armour Industrial Chemical Company, Chicago, Ill.
No Drawing. Filed Aug. 5, 1968, Ser. No. 749,946
Int. Cl. C08g *37/18*
U.S. Cl. 260—19 **8 Claims**

Hydroxyphenylstearic acid-phenol copolymers with aldehyde bridging, useful with epoxy resins as coating compositions.

3,577,371
NITRILOTRIACETIC ACID ALKYD RESINS
Noel D. Blair, Grand Island, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.
No Drawing. Filed Nov. 13, 1967, Ser. No. 682,586
Int. Cl. C08g *17/04, 17/16;* **C09d** *3/64*
U.S. Cl. 260—22 **12 Claims**

There are provided: Novel nitrilotriacetic acid alkyd resins and their water soluble ammonium or amine salts having utility as coating compositions on metal.

3,577,372
HOT MELT ADHESIVE COMPOSITIONS
Thomas P. Flanagan, Green Brook, and Irving I. Kaye, Murray Hill, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.
No Drawing. Filed July 30, 1968, Ser. No. 748,607
Int. Cl. C08f *45/52;* **C09j** *3/14, 7/00*
U.S. Cl. 260—23 **6 Claims**

Hot melt adhesive compositions comprising a blend of an atactic polypropylene resin and an aliphatic petroleum hydrocarbon tackifying resin. The resulting hot melts are utilizable in a variety of packaging, laminating and specialty hot melt applications.

3,577,373
WAX COMPOSITIONS CONTAINING AN ETHYLENE-ISOBUTYLACRYLATE COPOLYMER AND AN ORGANIC ACID
Charles J. Kremer, Brookhaven, and Donald S. Brown, Havertown, Pa., Dominic Apikos, Laurel Springs, N.J., and John T. Thean, Philadelphia, Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.
No Drawing. Filed Dec. 9, 1968, Ser. No. 782,408
Int. Cl. C08f *21/04, 45/52*
U.S. Cl. 260—23 **18 Claims**

This invention relates to wax compositions containing an acid component and an ethylene-isobutylacrylate copolymer. These compositions have highly improved resistance to stress cracking, and improved break energy and film toughness. They can be utilized as hot melt coatings for items such as paperboard and corrugated board for use in the food packaging industry.

3,577,374
COATING COMPOSITIONS COMPRISING POLYVINYL ACETAL
Robert A. Isaksen, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Continuation-in-part of application Ser. No. 624,702, Mar. 21, 1967. This application Dec. 26, 1968, Ser. No. 787,251
Int. Cl. C09d *3/74, 5/08, 5/10*
U.S. Cl. 260—23 **11 Claims**

Disclosed herein is a coating composition for application to various surfaces particularly wood or metal. When applied to metal, it is not necessary that the metal be previously cleaned of oxidation products and/or greasy, oily contaminants. The coating is based upon a blend of polyvinyl acetal and a styrene-alcohol interpolymer, such as styrene-allyl alcohol interpolymer, and/or esters and/or ester adducts thereof. Optionally, the coating may also contain chromium trioxide and/or aluminum powder.

3,577,375
STABLE AQUEOUS DISPERSIONS OF ETHYLENE POLYMERS PRODUCED BY CONTACTING THE DISPERSIONS WITH AN ACIDIC SULFONATED CATION EXCHANGE RESIN CHARGED WITH AMMONIUM IONS
Bert H. Clampitt, Overland Park, Kans., assignor to Gulf Research & Development Compnay, Pittsburgh, Pa.
No Drawing. Continuation of application Ser. No. 585,283, Oct. 10, 1966. This application June 20, 1969, Ser. No. 835,249
The portion of the term of the patent subsequent to May 12, 1987, has been disclaimed
Int. Cl. C08f *27/00*
U.S. Cl. 260—29.6 **10 Claims**

Stable aqueous dispersions of water-insoluble, self-emulsifiable ethylene-alkyl acrylate polymers substantially free of metallic cations are obtained by contacting aqueous dispersions of water-insoluble, self- emulsifiable ethylene-alkyl acrylate polymers containing metallic cations with a strongly acidic cation exchange resin charged with ammonium ions.

3,577,376
INTERPOLYMERIZATION OF ACRYLAMIDE, VINYL ACETATE AND OTHER MONOMERS BY USING A SOLUBILIZING AGENT TO DISSOLVE THE ACRYLAMIDE IN THE VINYL ACETATE
Raymond Lanthier, Pierrefonds, Quebec, and Lorenzo Ouellet, Dorion, Quebec, Canada, assignors to Gulf Oil Canada Limited, Toronto, Ontario, Canada
No Drawing. Continuation-in-part of application Ser. No. 688,348, Dec. 6, 1967. This application Oct. 24, 1968, Ser. No. 770,441
Int. Cl. C08f *1/08, 15/16*
U.S. Cl. 260—29.6 **11 Claims**

Process for aqueous emulsion interpolymerization of vinyl acetate and acrylamide with or without additional monomers in proportions to form stable 50–70% interpolymer solids emulsions, with 2–15% acrylamide by weight of the other monomers in the interpolymer, by dissolving the acrylamide in the vinyl acetate with the aid of a solubilizing agent before dispersing the monomers in an aqueous medium for interpolymerization. Examples of suitable specific solubilizing agents are methanol and formamide, materials which render acrylamide soluble in vinyl acetate and do not interfere with subsequent interpolymerization nor adversely affect the properties of the resulting interpolymer emulsion.

3,577,377
POLYESTER TIRE CORD ADHESIVE DIPS
Wun T. Tai, Monroeville, Pa., assignor to Koppers Company, Inc.
No Drawing. Filed Nov. 29, 1968, Ser. No. 780,208
Int. Cl. C08d *7/00;* **C09d** *5/02*
U.S. Cl. 260—29.7 **1 Claim**

Adhesive dips suitable for the bonding of polyester fibers to rubber in the manufacture of reinforced rubber articles are prepared from tris(monohydroxybenzyl) phenol and an aqueous rubber latex.

3,577,378
GLASS FIBER REINFORCED POLYCARBONATES
Hugo Strelb and Wilhelm Hechelhammer, Krefeld-Bockum, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Continuation-in-part of application Ser. No. 439,082, Mar. 11, 1965. This application Sept. 9, 1968, Ser. No. 758,614
Claims priority, application Germany, Mar. 12, 1964, F 42,281
Int. Cl. C08g *51/10*
U.S. Cl. 260—37 **8 Claims**

The invention meets with a process for the production of glass fiber reinforced polycarbonates by introducing milled, filamentized, water-sized glass fibers into a solution or a melt of polycarbonate resin, removing the solvent if necessary and extruding the glass fiber containing melt through a nozzle.

3,577,379
DARK COLORED COATINGS OF HIGH SOLAR HEAT REFLECTANCE
Melvin H. Sandler, Baltimore, and Merrill Cohen, Havre de Grace, Md., assignors to the United States of America as represented by the Secretary of the Army
Continuation-in-part of abandoned application Ser. No. 567,162, July 22, 1966. This application Mar. 11, 1969, Ser. No. 834,571
Int. Cl. C08g *51/04*
U.S. Cl. 260—40 **5 Claims**

A dark colored coating of high solar heat reflectance utilized to minimize heat build-up in the interior of objects exposed to sunlight comprising a mixture of pigments having a high-infrared reflectance such as quinacridone red, the violet to red shade of carbazole dioxazine, and titanium dioxide in combination with pigments such as lead chromate, molybdate orange, and phthalocyanine blue in order to obtain an acceptable color match. The pigment mixture is dispersed with extender pigments and suitable vehicles together with driers, volatile solvents, antioxidants, wetting agents, stabilizers and other additives of the art to form an enamel.

3,577,380
CROSS-LINKED CARBOXYLATED ELASTOMERS
Charles R. Binder, Romeo, Mich., assignor to General Motors Corporation, Detroit, Mich.
No Drawing. Filed June 28, 1968, Ser. No. 740,981
Int. Cl. C08g *41/00, 41/02*
U.S. Cl. 260—41.5 **5 Claims**

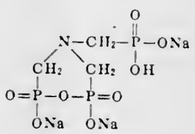
The strength of uncured elastomeric polymers containing pendant carboxyl groups may be markedly improved by cross-linking such elastomers through the carboxyl groups with polymethylene polyphenylisocyanate. In a preferred embodiment, a filler material containing reactive hydroxyl groups is incorporated into the curable mixture for additional cross-linking and further improvement in physical strength.

3,577,381
HEAT STABILIZATION OF POLYESTER RESIN WITH PHENYLPHOSPHINIC ACIDS
Mary J. Stewart, Riddlewood, Media, and John A. Price, Swarthmore, Pa., assignors to FMC Corporation, Philadelphia, Pa.
No Drawing. Filed Apr. 25, 1968, Ser. No. 724,280
Int. Cl. C08g *51/58*
U.S. Cl. 260—45.7 **9 Claims**

A composition including a high molecular weight, thermoplastic linear polyester resin and a heat stabilizing amount of diphenyl phosphinic acid or phenyl phosphinic acid, is disclosed herein.

3,577,382
POLYMERIC COMPOSITIONS COMPRISING ORGANO-AMINO-PHOSPHONATE ESTERS
Al F. Kerst, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Continuation-in-part of application Ser. No. 759,250, Sept. 11, 1968. This application June 11, 1969, Ser. No. 832,441
Int. Cl. C09k *3/28*
U.S. Cl. 260—45.8 **13 Claims**

This invention relates to polymeric compositions containing esters, salts and acids of partial anhydrides of organophosphonates which include such a compound as shown below.



ERRATUM

For Class 260—45.85 see:
Patent No. 3,577,556

3,577,383
DIBUTYL THIO UREA AS A UV ABSORBER FOR POLYURETHANES
Grant O. Sedgwick, Minneapolis, Minn., assignor to Ashland Oil, Inc., Ashland, Ky.
No Drawing. Filed Nov. 1, 1966, Ser. No. 591,129
Int. Cl. C08g *51/60*
U.S. Cl. 260—45.9 **5 Claims**

Aromatic diisocyanate derived polyurethanes which inherently exhibit a pronounced tendency toward discoloration upon exposure to UV light are stabilized against such deleterious effect by the presence therein of a small amount of a dialkyl substituted thio urea.

3,577,384
STABILIZED MOULDING COMPOSITIONS FROM POLYMERS OF α-OLEFINS
Otto Mauz, Niederhofheim, Taunus, and Eberhard Prinz, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed July 7, 1969, Ser. No. 839,713
Claims priority, application Germany, July 10, 1968, P 17 69 765.3
Int. Cl. C08f *45/58*
U.S. Cl. 260—45.85 **4 Claims**

Moulding compositions from polyolefins and a stabilizer mixture which consists of a tetraphenol and a dialkyl disulfide which are especially suitable for the manufacture of shaped articles coming into contact with hot water.

3,577,385
POLYURETHANE ELASTOMERS PREPARED BY REACTING A MIXTURE OF A POLYOXYALKYLENE ETHER DIOL OF A DIHYDRIC PHENOL AND A POLYOXYALKYLENE ETHER OF A POLYOL WITH AN ORGANIC POLYISOCYANATE
Joseph Feltzin and Nadji Y. Tehrani, Wilmington, Del., assignors to Atlas Chemical Industries, Inc., Wilmington, Del.
No Drawing. Filed May 15, 1967, Ser. No. 638,630
Int. Cl. C08g *22/26*
U.S. Cl. 260—47 **8 Claims**

Polyurethanes having improved properties are prepared by reacting polyoxyalkylene ether diols containing a carboxycyclic or oxacyclic ring and from 2 to 10 oxyalkylene

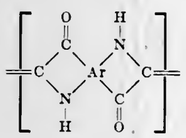
groups, polyoxyalkylene ether polyols containing from 5 to 10 hydroxyl groups and from 15 to 90 oxyalkylene groups, and organic polyisocyanates.

3,577,386
PRODUCT AND PROCESS
John E. Maier, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Filed Oct. 7, 1968, Ser. No. 765,676
Int. Cl. C08g *30/14, 30/16*
U.S. Cl. 260—47 **12 Claims**

A composition curable to an elastomer having outstanding physical properties, the composition having an epoxy resin, a polyether polyprimary polyamine containing recurring oxytetramethylene units and a tin acylate dissolved therein.

3,577,387
PROCESS OF PREPARING HEAT-RESISTANT POLYMERS
Hilde Kersten, Mechenhard, Erhard Siggel, Seckmauern, and Gerhard Meyer, Obernburg, Germany, assignors to Glanzstoff AG, Wuppertal, Germany
No Drawing. Filed Jan. 3, 1969, Ser. No. 788,931
Claims priority, application Germany, Jan. 8, 1968, P 17 20 884.3
Int. Cl. C08g *15/00*
U.S. Cl. 260—47 **3 Claims**

A high molecular weight polymer having recurring units of the formula



wherein Ar is one of the tetravalent aromatic radicals selected from the class consisting of phenylene, diphenylene, naphthylene, diphenylether and diphenylmethane as derived from a condensed aromatic bis-(2,4-dihydroxypyridine) compound by the steps of chlorination, alkoxylating, decarboxylating and finally polymerizing in an acid medium at about 20–300° C. Preferred long chain or relatively higher molecular weight polymers are achieved by polymerizing in inorganic non-oxidizing acids especially in polyphosphoric acid. The polymers are especially useful where stability to high temperatures and solvents is required.

3,577,388
FIBER PREPARED FROM POLYESTER BASED POLYURETHANE PREPOLYMER
Ignazio Salvatore Megna and Anthony Koroscil, Somerville, N.J., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Continuation-in-part of application Ser. No. 566,229, July 19, 1966. This application May 14, 1969, Ser. No. 824,685
Int. Cl. C08g *22/10, 22/16*
U.S. Cl. 260—75 **2 Claims**

Polyurethane spinning solutions which yield spandex fibers of improved elasticity are prepared by reacting an excess of an organic diisocyanate with a hydroxyl terminated polyester prepared by reacting adipic acid with an excess of a mixture of 1,4-butylene glycol and 1,2-propylene glycol wherein the glycols are present in a mole ratio of between 80:20 and 95:5, and then chain extending the resulting prepolymer with a diamine.

3,577,389
CHAR RESISTANT POLYURETHANE
George A. Kuhar, Greensburg, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Filed Aug. 19, 1968, Ser. No. 753,756
Int. Cl. C08g *22/06, 22/12*
U.S. Cl. 260—75 **5 Claims**

A polyurethane composition prepared by reacting o-tolidine diisocyanate, dicumyl peroxide and an unsaturated polyester diol of the structure obtained by the condensation of adipic acid and a mixture of ethylene glycol and glycerol α-allyl ether where the said composition has a Shore A hardness of from about 25 to about 45 and an arc image char rate of from about 1.5 to about 3 mils/second.

3,577,390
ORGANOSILICON-AMINO COMPOUNDS AS CATALYSTS IN POLYURETHANE PRODUCTION
William J. Owen, Penarth, Glamorgan, and Norman C. Lloyd, Cardiff, Glamorgan, Wales, assignors to Midland Silicones Limited, Reading, Berkshire, England
No Drawing. Filed Sept. 18, 1968, Ser. No. 760,710
Claims priority, application Great Britain, Sept. 27, 1967, 44,033/67
Int. Cl. C08g *22/36, 22/38, 22/44*
U.S. Cl. 260—77.5 **5 Claims**

Organosilicon amino compounds are employed as curing catalysts in the production of polyurethanes. The novel catalysts are defined by the formula

$$R_aR'_bN[QSiR''_3]_{3-a-b}$$

where R is hydrogen or certain organic radicals, R′ and R″ are certain organic radicals, Q is methylene, ethylene or propylene and *a* and *b* are 0 or 1.

3,577,391
ALCOHOL-BLOCKER ISOCYANATE COMPOSITIONS AND DERIVATIVES
Perry A. Argabright, Brian L. Phillips, and Vernon J. Sinkey, Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio
No Drawing. Original application Mar. 4, 1966, Ser. No. 531,772. Divided and this application Oct. 8, 1968, Ser. No. 798,506
Int. Cl. C08g *22/32*
U.S. Cl. 260—77.5 **11 Claims**

Urethane-containing compositions, particularly baked on coatings, are produced by the reaction of organic polyhalides with metal cyanates in the presence of monohydric alcohol and aprotic solvent.

3,577,392
WORKABLE POLYAMIDES BY BLENDING WITH INORGANIC THIOCYANATES
Rajindar K. Kochhar and Bert H. Clampitt, Overland Park, and Ronald E. Gilbert, Shawnee Mission, Kans., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed Oct. 31, 1968, Ser. No. 772,396
Int. Cl. C08g *20/38*
U.S. Cl. 260—78 **3 Claims**

Polyamides can be tailored to have more workable properties by blending with a minor portion of an inorganic thiocyanate such as sodium or potassium thiocyanate. With the exception of ammonium thiocyanate, which has the opposite effect on melt viscosity, the blends raise melt viscosity, and lower the normal freezing point. Individual physical properties of the extruded or molded polyamide blend remain the same or are improved, except with ammonium thiocyanate which reduces tensile strength and elongation.

3,577,393
ETHYLENE-PROPYLENE-DIENE TERPOLYMER RUBBERS AND PROCESSES THEREFOR
Albert Schrage, East Orange, and Jules Ernest Schoenberg, Bergenfield, N.J., assignors to Dart Industries Inc., Los Angeles, Calif.
Continuation-in-part of application Ser. No. 695,468, Jan. 3, 1968. This application Aug. 20, 1968, Ser. No. 753,995
Int. Cl. C08f *15/40*
U.S. Cl. 260—80.78 **7 Claims**

Substantially gel-free novel sulphur-curable elastomers prepared by reacting ethylene, an alpha-olefin (preferably propylene) and the cross-dimer of cyclopentadiene and methylcyclopentadiene.

3,577,394
2-CHLOROETHYL 2-CYANOACRYLATE AND COMPOSITIONS THEREOF
Joseph K. Harrington, Edina, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Filed Sept. 27, 1968, Ser. No. 763,378
Int. Cl. C08f *3/74*
U.S. Cl. 260—78.4 **3 Claims**

A useful cyanoacrylate monomer, 2-chloroethyl 2-cyanoacrylate, is provided, having utility in adhesive compositions. A process for its preparation is described.

3,577,395
NOVEL CATALYST FOR THE POLYMERIZATION OF CONJUGATED DIENES
Joginder Lal and Morford C. Throckmorton, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Filed Apr. 9, 1969, Ser. No. 814,831
Int. Cl. C08d *3/06*
U.S. Cl. 260—82.1 **10 Claims**

There is disclosed a process of the polymerization of butadiene and butadiene in mixture with other conjugated diolefins to form polymers containing a high portion of butadiene units in the cis 1,4 configuration comprising contacting at least one diolefin with a catalyst comprising (A) at least one compound selected from the group consisting of organometallic compounds wherein the metal is selected from Groups I, II and III of the Periodic Table and hydrides of metals of Groups II and III of the Periodic Table and their monomeric or polymeric halide derivatives, amine derivatives and complexes of these hydrides with amines, ethers or other molecules capable of forming complex compounds with these hydrides, (B) at least one organonickel compound and (C) at least one organic fluoro-chemical compound.

3,577,396
POLYMERIZATION OF CONJUGATED DIENES BY MEANS OF A NICKEL FLUOROBORATE HYDRATE/ORGANOMETALLIC COMPOUND CATALYST SYSTEM
Morford C. Throckmorton, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Filed June 30, 1969, Ser. No. 837,906
Int. Cl. C08d *3/06*
U.S. Cl. 260—82.1 **7 Claims**

There is disclosed a process for the polymerization of butadiene and butadiene in mixture with other conjugated diolefins to form polymers containing a high portion of the butadiene units in the cis-1,4 configuration comprising contacting at least one diolefin under polymerization conditions with a binary catalyst system comprising (A) at least one nickel fluoroborate hydrate containing from 15% to 31% by weight of water of hydration and (B) at least one organometallic compound wherein the metal is selected from Groups I, II and III of the Periodic Table.

3,577,397
PROCESS AND PRODUCT FROM TREATING LIVE ELASTOMERS WITH PHOSPHAZENES
Adel F. Halasa, Bath, Ohio, and Russell W. Koch, Blacksburg, Va., assignors to The Firestone Tire & Rubber Company, Akron, Ohio
No Drawing. Continuation of application Ser. No. 711,927, Mar. 11, 1968. This application Nov. 24, 1969, Ser. No. 879,596
Int. Cl. C08d *5/04;* **C08f** *27/08*
U.S. Cl. 260—85.1 **13 Claims**

The process described herein involves a method of converting relatively low molecular weight elastomers prepared by alkali metal-catalyzed polymerizations, such as alkyllithium catalyst polymerizations, and still containing active lithium or other alkali metal therein, by postreaction with phosphazenes, which can be represented as $(PNCl_2)_x$ wherein x is 3 or 4. The postreacted products are highly branched elastomers having a broad molecular weight distribution and possessing less cold flow than the polymers from which they are produced. Surprisingly, even though the molecular weight of the polymer is increased many times, the reaction product displays little or no cold flow even after extension with oil.

3,577,398
SYNTHETIC RESIN
Henry A. Pace and Victor J. Anhorn, Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Continuation of application Ser. No. 556,293, June 9, 1966. This application Sept. 12, 1969, Ser. No. 857,598
Int. Cl. C08d *3/04*
U.S. Cl. 260—85.3 **1 Claim**

A polymeric resinous composition comprising from about 40 to about 80 weight percent units derived from piperylene and from about 60 to about 20 weight percent units derived from 2-methyl-2-butene wherein the said resinous composition has a softening point of from about 80° C. to about 110° C. The said polymeric resinous composition can be modified by having up to about 25 weight percent units derived from certain other unsaturated hydrocarbons. The polymeric resinous composition is prepared by polymerizing a mixture comprising from about 20 to about 75 weight percent of piperylene and from about 80 to about 25 weight percent of 2-methyl-2-butene in the presence of an anhydrous metal halide selected from aluminum chloride and stannic chloride.

3,577,399
ETHYLENE INTERPOLYMERS
George A. Mortimer, La Marque, Tex., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Sept. 23, 1968, Ser. No. 761,837
Int. Cl. C08f *15/04*
U.S. Cl. 260—88.1 **4 Claims**

Compositions of matter comprised of interpolymers of ethylene and from 1 to 10 mole percent of a monovinyl silane and a method for their preparation.

3,577,400
NOVEL CATALYSTS FOR THE POLYMERIZATION OF ALICYCLIC OLEFINS
William Allen Judy, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Filed Aug. 26, 1968, Ser. No. 755,376
Int. Cl. C08f *15/04*
U.S. Cl. 260—88.2 **13 Claims**

A method for the ring opening polymerization of unsaturated alicyclic compounds containing at least 4 and not more than 5 carbon atoms and one double bond in

the cyclic ring and unsaturated alicyclic compounds containing at least 8 carbon atoms and at least one double bond in the cyclic ring is disclosed which comprises subjecting such unsaturated alicyclic compounds to a catalyst system comprising (A) a tungsten or molybdenum halide or oxyhalide and (B) at least one Lewis acid of the formula $M—X_n$ where M is a metal represented by aluminum, zinc, gallium, tin and antimony; X is a halogen such as bromine, chlorine, iodine and fluorine and *n* is an integer equal to the valence of M.

3,577,401
POLYMERIZATION OF VINYL CHLORIDE USING AN IN-SITU INITIATOR AND A BASIC CALCIUM COMPOUND AS A BUFFER
Edwin Studley Smith, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Filed Feb. 17, 1969, Ser. No. 799,953
Int. Cl. C08f *1/11, 1/60, 3/30*
U.S. Cl. 260—92.8 **5 Claims**

Process for making polyvinyl chloride having improved resistance to "plate out" using a basic calcium compound as a buffer in combination with a peroxydicarbonate initiator formed in-situ.

3,577,402
PASTE ROSIN SIZE CONTAINING VISCOSITY DEPRESSANT
Robert Alan Dorbransky, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed July 24, 1968, Ser. No. 747,132
Int. Cl. C08h *11/00*
U.S. Cl. 260—97 **2 Claims**

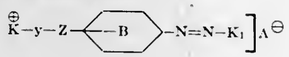
Paste rosin size at 150°–200° F. containing 0.5%–5% of a water-soluble alkanepolyol which has a molecular weight below 250 and a boiling point above 150° C. possesses low viscosity and decreased tendency to develop a hard, brittle, foamy crust when exposed to the air in that temperature range.

3,577,403
1,1-BIS-[4-(1'-BENZYL-3'-METHYL-PYRAZALONE-AZO)PHENYL]CYCLOHEXANE
Hans Raab and Günter Hagelloch, Cologne-Stammheim, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Dec. 12, 1967, Ser. No. 689,786
Claims priority, application Germany, Dec. 17, 1966, F 50,995
Int. Cl. C09b *31/14;* **C09d** *11/16, 11/18*
U.S. Cl. 260—160 **1 Claim**

A water-insoluble diazo dyestuff particularly advantageous in the dyeing of inks and pastes for ball point pens is produced by coupling 1-benzyl-3-methyl-pyrazolone with 1,1-bis-(4-aminophenyl)cyclohexane.

3,577,404
BASIC PYRAZOLONE MONOAZO DYES CONTAINING AN AMMONIUM OR HYDRAZINIUM GROUP
Roland Entschel, Basel, Curt Mueller, Binningen, Basel-Land, and Willy Steinemann, Basel, Switzerland, assignors to Sandoz Ltd., also known as Sandoz A.G., Basel, Switzerland
No Drawing. Filed July 23, 1968, Ser. No. 746,758
Claims priority, application Switzerland, Aug. 11, 1967, 11,369/67; July 15, 1968, 10,552/68
Int. Cl. C09b *29/38;* **D06p** *1/06, 3/04*
U.S. Cl. 260—162 **12 Claims**

Basic dyes of the formula



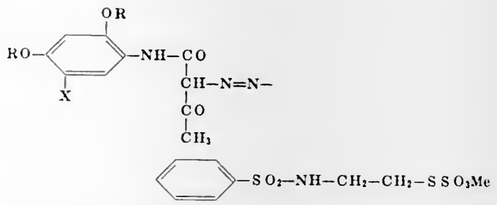
wherein

K_1 stands for a coupling compound of the pyrazolone series,
y stands for an alkylene or arylene radical,
Z stands for —O—, —S— or $—SO_2—$,
$K^{\oplus}$ stands for a hydrazinium- or an ammonium group and wherein the ring B may bear further substituents;

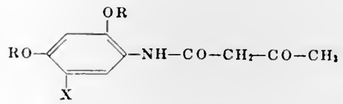
are useful for dyeing acrylonitrile polymers and copolymers. Resulting dyeings have good fastness properties.

3,577,405
WATER-SOLUBLE, YELLOW MONO-AZO DYES WITH ACTIVE METHYLENE COUPLER
Hermann Hoffmann, East Greenwich, and Helmut Schmidt, Warwick, R.I., assignors to American Hoechst Corporation, New York, N.Y.
No Drawing. Filed May 8, 1968, Ser. No. 727,715
Int. Cl. C07c *107/04;* **C09b** *29/32*
U.S. Cl. 260—193 **8 Claims**

Azo dyes of the formula



in which R stands for methyl or ethyl, X stands for hydrogen or chlorine, and Me represents an alkali metal or ammonium, are prepared by combining diazotized 2-(4'-amino-benzenesulfonylamino)-ethyl-thiosulfuric acid with a coupling component of the formula



in which R stands for methyl or ethyl and X stands for hydrogen or chlorine, at a temperature between 0° C. and 20° C. and a pH between 2 and 6, which azo dyes are readily soluble in water and have good to excellent fastness when applied to native or regenerated cellulose, cellulose acetate, wool, silk, leather and synthetic materials such as polyester and especially polyamide fibers.

3,577,406
PROCESS FOR PREPARING THE ANTIBIOTIC STREPTOZOTOCIN
Edward J. Hessler, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Filed May 23, 1968, Ser. No. 731,615
Int. Cl. C07c *95/04*
U.S. Cl. 260—211 **6 Claims**

A chemical process for preparing the antibiotic streptozotocin starting with D-glucosamine which is reacted with N-methylisocyanate to produce N-(methylcarbamcyl)-D-glucosamine, and then reacting this latter compound with a nitrosating agent to produce streptozotocin. Streptozotocin is disclosed in U.S. Patent 3,027,300 as useful for veterinary purposes because of its high activity against *Pasteurella multocida* and *Salmonella pullorum*.

3,577,407
HIGHLY HYDROXYPROPYLATED GRANULE POTATO STARCH
Erling I. Hjermstad, Cedar Rapids, Iowa, assignor to Penick & Ford, Limited, Cedar Rapids, Iowa
No Drawing. Filed May 19, 1969, Ser. No. 826,027
Int. Cl. C08b *19/06*
U.S. Cl. 260—233.3 **3 Claims**

A process for the production of hydroxypropylstarch in the water-washable granule form even after reaction to a high degree of substitution (up to 20–30% hydroxypropyl content) by treating potato starch granules at elevated temperatures in water suspesion of near-neutral pH for at least one hour followed by alkaline catalyzed hydroxypropylation.

3,577,408
TETRAHYDRO-2-OXOFURAN PENICILLINS
Harvey E. Alburn, West Chester, William Dvonch, Radnor, and Stephan Sallay, Wynnewood, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Filed Oct. 15, 1968, Ser. No. 767,822
Int. Cl. C01d *99/16*
U.S. Cl. 260—239.1 **3 Claims**

6-(tetrahydro - 2 - oxofuran - 3 - carboxamido)penicillanic acids which may be substituted in the 3 and 5 positions, or the opened ring forms of these penicillins are produced, having antibiotic activity.

ERRATUM

For Class 260—239.3 see:
Patent No. 3,577,557

3,577,409
2-RCH_2NH-4-X-5-SULFAMYLBENZOIC ACIDS
Edward J. Cragoe, Jr., Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.
No Drawing. Filed Dec. 7, 1965, Ser. No. 512,217
Int. Cl. C07d *7/04, 15/04, 15/12*
U.S. Cl. 260—239.6 **6 Claims**

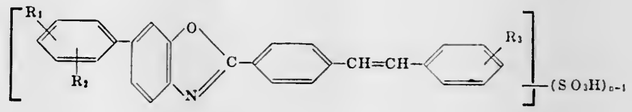
4-chloro or bromo-5-sulfamyl-N-substituted-anthranilic acid diuretic compounds, having as N-substituents a saturated pyranylmethyl, a dioxolanylmethyl, or a dioxanylmethyl group are described. These products are prepared by the reaction of 2,4-dihalo-5-sulfamylbenzoic acid and RCH_2NH_2 where R is a tetrahydropyranyl, a dioxolanyl or a dioxanyl group.

3,577,410
13β-ALKYL-17-HYDROXYGONA-4,14-DIEN-3-ONES
Daniel M. Teller, King of Prussia, George H. Douglas, Paoli, and Herchel Smith, Wayne, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Filed July 30, 1968, Ser. No. 749,922
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 **25 Claims**

New steroids of the 13β-alkyl-17β-hydroxygona-4,14-dien-3-one series optionally substituted at C–7 and C–17 by α-methyl (I) are provided by either (a) isomerizing a corresponding 17-hydroxy-13β-alkylgona-5(10),14-dien-3-one (II) or (b) reacting with a methyl Grignard reagent a corresponding 17-hydroxy-13β-alkylgona-4,6,14-trien-3-one (III). Means are provided to prepare the intermediate compounds II and III. Compounds I and Ia are androgenically-active in warm-blooded lower animals.

3,577,411
6-PHENYLBENZAZOLYL DERIVATIVES
Peter Liechti, Binningen, Leonardo Guglielmetti, Birsfelden, Erwin Maeder, Aesch, Basel-Land, and Adolf Emil Siegrist, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland
No Drawing. Continuation-in-part of application Ser. No. 483,355, Aug. 27, 1965. This application Oct. 9, 1967, Ser. No. 673,953
Claims priority, application Switzerland, Sept. 4, 1964, 11,401
Int. Cl. C07d *85/48*
U.S. Cl. 260—240 **10 Claims**

The present invention relates to new and valuable 6-phenyl-2-stilbenyl-benzoxazoles which may be represented by the formula



wherein R_1, R_2 and R_3 are identical or different and each represents a member selected from the group consisting of hydrogen, halogen, alkyl or alkoxy containing 1 to 12 carbon atoms, phenyl, phenylalkyl with 1 to 4 carbon atoms in the alkyl portion, nitrile, free or neutralized carboxyl (—COO cation), carboxylic acid alkyl ester with 1 to 12 carbon atoms in the alkyl portion, carbon amide, carbon alkyl amide with 1 to 12 carbon atoms, free or neutralized sulphonic acid ($—SO_2O$ cation) or sulphonamide, and *n* stands for the whole numbers 1 to 3.

The compounds of this invention are especially useful as optical brighteners for organic materials.

3,577,412
PROCESS FOR RECOVERING CEPHALOSPORIN C_A ANTIBIOTICS
Billy G. Jackson, 4230 Lincoln Road 46208; and John L. Spencer, 1045 W. 77th S. Drive 46260, both of Indianapolis, Ind.; and Harvey M. Higgins, Jr., R.R. 1, Box 220–A, Danville, Ind. 46227
No Drawing. Continuation-in-part of abandoned application Ser. No. 437,553, Mar. 5, 1965. This application Apr. 29, 1969, Ser. No. 820,325
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 **2 Claims**

Removing Cephalosporin C_A antibiotics, e.g., cephaloridine, from concentrated, inorganic salt solutions thereof as the hydrothiocyanate salt using hydrochloric or sulfuric acid.

3,577,413
PROCESS OF PREPARING TRITYLAMINES
Charles R. Adams, Oakland, Calif., and Hans J. Arpe, am Quintengarten, Hans J. Schulze-Steinen, Bad Soden, Taunus, and Jurgen F. Falbe, Wasserland, Germany, Alan C. Edwards, The Hague, Netherlands, and Hans Tetteroo, Wasserland, Germany, assignors to Shell Oil Company, New York, N.Y.
No Drawing. Filed Oct. 11, 1967, Ser. No. 674,637
Claims priority, application Germany, Oct. 14, 1966, P 16 20 412.9
Int. Cl. C07d *87/26*
U.S. Cl. 260—247 **8 Claims**

Process of preparing tritylamines by reacting a primary or secondary amine with a trityl chloride-Friedel-Crafts catalyst complex, e.g., N-tritylmorpholine is prepared by reacting morpholine with a trityl chloride-aluminum trichloride complex.

3,577,414
BERYLLIUM HYDRIDE TERTIARY AMINE COMPLEXES

Lawrence H. Shepherd, Jr., Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 645,560, June 5, 1967. This application Mar. 27, 1968, Ser. No. 716,669
Int. Cl. C07d *87/26, 27/04*
U.S. Cl. 260—247 6 Claims

Complexes of beryllium hydride with tertiary amines, containing one molecule of beryllium hydride for each tertiary amino nitrogen atom in the amine, are prepared by reaction of beryllium hydride with an excess of a tertiary amine in a ball or rod mill at ambient temperature and pressure.

3,577,415
1-SUBSTITUTED-3-SUBSTITUTED PHENOXYPYRROLIDINES

Albert Duncan Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,395
Int. Cl. C07d *27/04*
U.S. Cl. 260—247.2 10 Claims

1-substituted-3-substituted phenoxypyrrolidines useful as anti-depressants are disclosed. The compounds are prepared from 1-methyl-3-pyrrolidinols and 1-benzyl-3-pyrrolidinols.

3,577,416
PROCESS FOR THE SELECTIVE CHLORINATION OF ALKYLMERCAPTO-SUBSTITUTED s-TRIAZINES

Werner Schwarze, Frankfurt am Main, Günter Gieselmann, Neu-Isenburg, and Wolfgang Weigert, Offenbach am Main, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

No Drawing. Filed Feb. 13, 1969, Ser. No. 799,099
Claims priority, application Germany, Feb. 17, 1968, P 16 70 590.1
Int. Cl. C07d *55/48*
U.S. Cl. 260—248 18 Claims

s-Triazines which are 2 or 2,4 or 2,4,6 substituted by alkylmercapto groups and wherein the balance of said 2,4,6 substituents is substituted by chlorine, if any, are selectively chlorinated by subjecting the triazines to the action of a chlorinating agent, the amount of chlorinating agent in said reaction being selected to provide for at least two chlorine atoms for each alkylmercapto group to be converted, whereby a predetermined number of said alkylmercapto groups may be converted to chlorine. The products of the reaction are valuable for making herbicides, optical brighteners, light stabilizers, and other compounds and are useful also as stabilizers for polyformaldehyde and as starting products for making stabilizers for the rubber industry.

3,577,417
2,4,6-TRISUBSTITUTED-s-TRIAZINES

Margot Louise Cantrall, New City, Martin Leon Sassiver, Monsey, and Robert Gordon Shepherd, South Nyack, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 22, 1969, Ser. No. 827,048
Int. Cl. C07d *55/22*
U.S. Cl. 260—249.6 10 Claims

This disclosure describes compounds of the class of N^2 - (polycycloalkyl) - N^4,N^6-bis(aliphatic or alicyclic) melamines useful as anti-mycobacterial agents.

3,577,418
PYRAZINAMIDE DERIVATIVES AND PROCESSES FOR THEIR PREPARATION

Edward J. Cragoe, Jr., Lansdale, and Kenneth L. Shepard, Ambler, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation-in-part of application Ser. No. 718,976, Mar. 21, 1968, which is a continuation-in-part of application Ser. No. 666,004, Sept. 7, 1967. This appplication Feb. 12, 1969, Ser. No. 798,809
Int. Cl. C07d *51/76*
U.S. Cl. 260—250 49 Claims

A new method is disclosed for the preparation of pyrazinamide derivatives. The process involves reaction of an amine derivative with a very reactive pyrazinoyloxyacrylamide prepared by reaction between a pyrazinoic acid and an isoxazolium salt. The reactivity of the pyrazinoyloxyacrylamide permits the preparation of compounds previously unavailable and hence many of the products are new compounds. The compounds prepared by this process have utility as diuretics.

3,577,419
2,6-DISUBSTITUTED-4-(ω-AMINOALKOXY) PHENYL PYRIMIDINES

Rudolf G. Griot, Riehen, Switzerland, assignor to Sandoz-Wander, Inc., Hanover, N.J.

No Drawing. Continuation-in-part of application Ser. No. 725,197, Apr. 29, 1968. This application Oct. 24, 1969, Ser. No. 869,330
Int. Cl. C07d *51/36*
U.S. Cl. 260—256.4 12 Claims

This invention relates to 2-substituted-6-cyclosubstituted-4-[4-(ω-aminoalkoxy)phenyl]pyrimidines useful as hypolipidemics and/or as anti-convulsants, and to preparation of said compounds.

3,577,420
CERTAIN 4-AMINOFURO[2,3-d]PYRIMIDINES

Hans-Jurgen E. Hess, Groton, and Timothy H. Cronin, Niantic, Conn., assignors to Pfizer Inc., New York, N.Y.

No Drawing. Filed Jan. 5, 1968, Ser. No. 695,868
Int. Cl. C07d *99/04*
U.S. Cl. 260—256.4 4 Claims

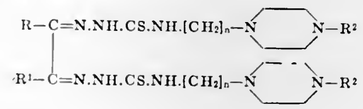
4-aminofuro[2,3-d]pyrimidines relax smooth muscle and inhibit cyclic 3′,5′-nucleotide phosphodiesterase activity. The compounds are synthesized by condensing α-haloketone or aldehyde with dimethyl malonate, reacting the ethylene ketal malonamide therewith alkanoic acid ester, cyclizing with acid to obtain the furo[2,3-d]pyrimidine-4-one, then obtaining a 4-amino derivative through the 4-chloro intermediate. The 5,6-alkylene compounds are prepared by condensing α-hydroxy cyclic ketone with malonitrile and cyclizing with alkanoic acid amide.

3,577,421
PIPERAZINE SUBSTITUTED DITHIOSEMICARBAZONES

Paul Anthony Barrett, London, England, assignors to Burroughs Wellcome Co., Triangle Park, N.C.

No Drawing. Filed May 18, 1966, Ser. No. 550,934
Claims priority, application Great Britain, May 25, 1965, 22,006/65
The portion of the term of the patent subsequent to Nov. 11, 1986, has been disclaimed
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 5 Claims

A compound



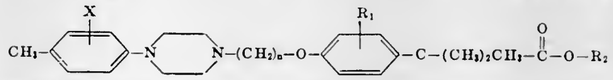
where R and R^1 are hydrogen, alkyl, cyclohexyl, benzyl, phenyl, halogen substituted phenyl or alkyloxyalkyl, R^2 is lower alkyl and *n* is a number from 1 to 8. The compounds are useful in the treatment of coccidiosis.

3,577,422
4-[ω-[4-(2-, OR 3-HALO-p-TOLYL) - 1-PIPERAZINYL] ALKOXY] - β,β - DIMETHYLHYDROCINNAMIC ACID ESTERS

Norman E. Wideburg and Laura H. Miller, Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Continuation of application Ser. No. 717,392, Mar. 29, 1968. This application Apr. 10, 1968, Ser. No. 720,348
Int. Cl. C07d *51/70*
U.S. Cl. 260—268 4 Claims

Newly synthesized 4-[ω-[4-(2-, or 3-halo p-tolyl)-1-piperazinyl]alkoxy] - β,β - dimethylhydrocinnamic acid esters useful for chemotherapeutically reducing the number of flukes of genus Schistosoma present in infected warm-blooded animals have been found to alleviate symptoms of schistosomiasis. These esters have the structural formula



wherein X is a halogen; *n* is an integer of from 3 to 6; R_1 is hydrogen or lower alkoxy; and R_2 is methyl, ethyl, or a straight or branched chain alkyl radical of up to 5 carbon atoms. The esters are prepared by microbiologically oxidizing a 1-(2-, or 3-halo-p-tolyl)-4-[ω-(p-tert-pentylphenoxy) alkylene]piperazine to the corresponding hydrocinnamic acid and then esterifying the acid.

3,577,423
1,4-BIS-(3-INDOLEGLYOXYLOYL) PIPERAZINES AND DERIVATIVES THEREOF

John L. Archibald, Malvern, and Meier E. Freed, Philadelphia, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Original application Dec. 3, 1965, Ser. No. 511,362, now Patent No. 3,471,499, dated Oct. 7, 1969. Divided and this application June 26, 1969, Ser. No. 844,717
Int. Cl. C07d *57/100*
U.S. Cl. 260—268 14 Claims

The compounds are 1,4-bis-(3-indoleglyoxyloyl)piperazines. Said compounds are useful as intermediates in the preparation of corresponding 1,4-bis(2-indol-3-yl-ethyl)piperazines and their salts, which are pharmacologically active as hypotensives.

3,577,424
4-PHENYL-8-AMINO TETRAHYDROISOQUINOLINES

Gustav Ehrhart, Bad Soden, Taunus, Karl Schmitt, Frankfurt am Main, Irmgard Hoffmann, Bad Soden, Taunus, and Heinrich Ott, Eppstein, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Continuation-in-part of application Ser. No. 635,398, May 2, 1969. This application Oct. 20, 1969, Ser. No. 867,932
Claims priority, application Germany, May 5, 1966, F 49,122; Aug. 12, 1966, F 49,122; Apr. 15, 1967, F 52,134, F 52,135
Int. Cl. C07d *35/38*
U.S. Cl. 260—287 9 Claims

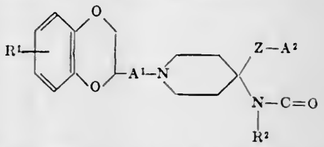
4-phenyl-8-amino tetrahydroisoquinolines having centrally stimulating and thymoleptic action. Methods for their manufacture by ring closure, acylation, or reduction. Pharmaceutical compositions containing these compounds.

3,577,425
8-(1,4-BENZODIOXAN-2-YLMETHYL)-3-OXO-1-THIA-4,8-DIAZASPIRO[4.5]DECANES

Michio Nakanishi, Oita, Katsuo Arimura, Fukuoka, Hiroshi Imamura, Chiba, and Toshihiro Kobayakawa, Fukuoka, Japan, assignors to Yoshitomi Pharmaceutical Industries, Ltd., Osaka, Japan

No Drawing. Filed Dec. 10, 1968, Ser. No. 782,752
Claims priority, application Japan, Dec. 11, 1967, 42/79,638; Dec. 13, 1967, 42/80,743
Int. Cl. C07d *29/34*
U.S. Cl. 260—293.4 19 Claims

Benzodioxane derivatives of the formula



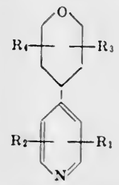
and pharmaceutically acceptable salts thereof, wherein R^1 is H, Cl, methyl or methoxy, R^2 is H, alkyl of 1 to 4 carbon atoms, benzyl, phenyl or substituted phenyl in which the substituent is selected from the group consisting of Cl, methyl methoxy and trifluoromethyl, A^1 is —CH_2—, —CH_2CH_2—, —CO— or —CH_2CO— the carbonyl portion of which is bound to the N atom of the piperidine ring or —CH(OH)—CH_2— the methylene (—CH_2—) portion of which is bound to the N atom of the piperidine ring, A^2 is —CH_2—, or =$CHCH_3$, and Z is —S—, —SO— or —SO_2—, are vasodilators of low toxicity in mammals.

3,577,426
4-(4-TETRAHYDROPYRANYL)PYRIDINES

Charles K. McGill and George W. Campbell, Jr., Indianapolis, Ind., assignors to Reilly Tar & Chemical Corporation, Indianapolis, Ind.

No Drawing. Filed Jan. 31, 1969, Ser. No. 795,714
Int. Cl. C07d *31/30*
U.S. Cl. 260—297 10 Claims

4-(tetrahydropyranyl)pyridines having the formula:



in which R_1 and R_2 represent hydrogen or lower alkyl; R_3 and R_4 represent hydrogen, lower alkyl, or phenyl; they may be alike or they may be different. In general the tetrahydropyranylpyridines are made by the dehydration of a pyridyl pentanediol.

3,577,427
BROMINATION OF 2,1,3-BENZOTHIADIAZOLES AND BENZOFURAZANS

Kurt H. Pilgram, Modesto, Calif., assignor to Shell Oil Company, New York, N.Y.

No Drawing. Filed Sept. 5, 1968, Ser. No. 757,768
Int. Cl. C07d *85/48, 91/44*
U.S. Cl. 260—304 5 Claims

Aqueous hydrobromic acid or nitric acid is used as the reaction medium for bromination of 2,1,3-benzothiadiazoles and benzofurazans.

3,577,428
2-AMINO-4-ARYLOXYALKYL-4-ALKYL-2-OXAZOLINES
John T. Suh, Mequon, and Joseph A. Skorcz, Milwaukee, Wis., assignors to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Filed Apr. 14, 1969, Ser. No. 816,078
Int. Cl. C07d *85/36*
U.S. Cl. 260—307 **5 Claims**

Compounds are 2-amino-4-aryloxyalkyl-4-alkyl-2-oxazolines which are useful as central nervous system stimulants and antihypertensive agents. The compounds may also be used as intermediates in the preparation of pickling agents, mothproofing agents and wood preservatives. Among the compounds disclosed is 2-amino-4-methyl-4-(o-methoxyphenoxy)methyl-2-oxazoline hexamate.

3,577,429
PHTHALOCYANINE DYE AND METHOD FOR MAKING SAME
Thomas C. Crawford, 4423 Ridgevalley Drive, Charlotte, N.C. 28208
No Drawing. Filed Mar. 11, 1968, Ser. No. 711,913
Int. Cl. C09b *47/08*
U.S. Cl. 260—314.5 **6 Claims**

Copper tetra - (4) - sodiothiosulfatophthalocyanine dye useful for dyeing cotton and regenerated cellulose textiles green is prepared by simultaneously heating and aerating for 1–36 hours at 40° C.–90° C. and at pH 6.5–7.5 an aqueous composition comprising 1 part copper tetra-(4)-thiocyanophthalocyanine, 0.65–1.3 parts sodium bisulfite, and 0.65–1.3 parts sodium sulfite, and further characterized in that the parts of sodium sulfite and sodium bisulfite are approximately equal.

3,577,430
OXINDOLE ACETIC ACID AMIDES
Janis Plostnieks, Philadelphia, Pa., assignor to McNeil Laboratories, Inc.
No Drawing. Continuation-in-part of application Ser. No. 642,685, June 1, 1967. This application Feb. 17, 1969, Ser. No. 799,948
Int. Cl. C07d *27/40*
U.S. Cl. 260—325 **14 Claims**

The compounds are of the class of 2-oxindole acetamides useful as ultra-violet light absorbers and having central nervous system depressant activity; and of the class of 2-oxo-3-indoline acetate esters useful as intermediates in the preparation of said acetamides.

3,577,431
SANDWICH-TYPE CHEMICAL COMPOUNDS AND METHOD FOR THEIR PREPARATIONS
Earl Dan Flickinger, El Dorado, and Charles Merlyn Buess, Wichita, Kans., assignors to Skelly Oil Company, Tulsa, Okla.
No Drawing. Continuation-in-part of application Ser. No. 554,651, June 2, 1966. This application Feb. 19, 1968, Ser. No. 706,663
Int. Cl. C07d *27/28*
U.S. Cl. 260—326.1 **5 Claims**

New compositions of matter having two ring nuclei composed of 6 carbon atoms essentially superimposed in fixed parallel planes with respect to each other and process of preparing the same.

3,577,432
1-SUBSTITUTED-3-PHENOXYPYRROLIDINES
Grover Cleveland Helsley, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.
No Drawing. Filed Dec. 23, 1968, Ser. No. 786,383
Int. Cl. C07d *27/04*
U.S. Cl. 260—326.3 **15 Claims**

1-substituted-3-phenoxypyrrolidines useful as muscle relaxants, anti-convulsants and major tranquilizers are disclosed. The compounds are prepared from 3-phenoxypyrrolidines.

3,577,433
KETO-ENOL NITROGEN-CONTAINING HETEROCYCLES HAVING AN AMINO SUBSTITUENT
Robert Fuks, Ixelles, Brussels, and Heinz G. Viehe, Beersel, Linkebeek, Belgium, assignors to Union Carbide Corporation
No Drawing. Filed Aug. 8, 1967, Ser. No. 659,013
Int. Cl. C07d *27/16*
U.S. Cl. 260—326.5 **9 Claims**

There is disclosed a new class of nitrogen-containing heterocyclic compounds. The new compounds have a nitrogen hetero atom in a five- or six-membered ring (the ring can be fused to one or more other rings), an amino substituent on the ring carbon alpha to the hetero nitrogen, and an oxygen (either carbonyl or hydroxyl) bonded to the ring carbon gamma to the hetero nitrogen. The new compounds are exemplified by 3-hydroxy-5-amino-pyrrolenines and 4-hydroxy-2-amino-quinolines (or the ketone tautomers thereof). The new compounds are produced by reacting an alpha- or a beta-aminoester with an N,N-disubstituted-1-amino-1-alkyne or an N,N,N',N'-tetrasubstituted-1,1-diamino-1-alkene. This process for producing the new compounds is also novel. The compounds are useful as hydrogen halide acceptors and catalysts.

3,577,434
N-ARYL - α - (HYDROXYMETHYLENEIMINO)-α'-OXO-CYCLOPOLYMETHYLENEAMINE AND RELATED COMPOUNDS AND A METHOD FOR THEIR PREPARATION
Stanley C. Bell, Penn Valley, and Peter H. L. Wei, Upper Darby, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Filed June 10, 1968, Ser. No. 735,524
Int. Cl. C07d *27/08*
U.S. Cl. 260—326.5 **10 Claims**

The disclosure is directed to N - aryl - α - (hydroxymethyleneimino) - α' - oxocyclopolymethyleneamines, N-aryl - α - (methyleneimino) - β - alkanoyl - α' - oxocyclopolymethyleneamines, their substituents, and a method for their preparation. The compounds have central nervous system activity as depressants. That is, they produce a calming effect in the host.

3,577,435
PROCESS FOR THE PREPARATION OF 3-ARYL-2-IMINO-3-INDOLINOLS AND RELATED COMPOUNDS
Stanley C. Bell, Narberth, and Carl Gochman, Philadelphia, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 694,066, Dec. 28, 1967. This application Aug. 14, 1968, Ser. No. 752,488
Int. Cl. C07d *27/38*
U.S. Cl. 260—326.11 **9 Claims**

A new process is disclosed reacting a 2-benzoyl acylanilide with ionic cyanides to form new 3-aryl-2-imino-3-indolinols and 2-amino-3-aryl-3H-indol-3-ols. These products may be further reacted to form a number of new derivatives which have pharmacological activity as central nervous system depressants.

ERRATUM

For Class 260—328 see:
Patent No. 3,577,558

3,577,436
2-SUBSTITUTED-CYCLOPENTA[β] THIANAPHTHENE-3-ONES
John T. Suh, Mequon, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 599,698, Dec. 7, 1966. This application Nov. 25, 1969, Ser. No. 879,904
Int. Cl. A61k *27/00;* **C07d** *63/22*
U.S. Cl. 260—330.5 **6 Claims**

The compounds are 2-substituted-cyclopenta[β]thianaphthene-3-ones useful as tranquilizing agents. A compound disclosed is 1-H-2(dimethylaminomethyl)cyclopenta[β]thianaphthene-3-one.

3,577,437
EPOXY RESINS FROM ALKYLATED PHENOL NOVOLAC RESINS
John R. Le Blanc, Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Jan. 6, 1969, Ser. No. 789,346
Int. Cl. C08g *5/08, 30/06*
U.S. Cl. 260—33.6 **14 Claims**

Improved epoxy novolac resins produced by first reacting epichlorohydrin with an alkylated phenol aldehyde novolac resin wherein said alkylate is a specific C_8 through C_{13} mixture of carbocyclic compounds, and then thereafter dehydrohalogenating the resulting product.

3,577,438
METHOD OF PRODUCING OXETANE ESTERS
Bruce Allen Melaas, Corpus Christi, Tex., assignor to Celanese Corporation
No Drawing. Original application Oct. 31, 1963, Ser. No. 320,557, now Patent No. 3,328,427, dated June 27, 1967. Divided and this application Mar. 13, 1967, Ser. No. 635,936
Int. Cl. C07d *3/00*
U.S. Cl. 260—333 **1 Claim**

Disclosed herein are methods for producing bicyclic ortho esters and their isomers, oxetane esters. Bicyclic ortho esters are prepared by direct esterification of trimethylolalkanes with certain monocarboxylic acids. The bicyclic ortho ester can be converted to the oxetane isomer by heating at a temperature of from 275° C. to 525° C. in the presence of an alumina isomerization catalyst.

3,577,439
3-(1,8-DIMETHOXY-4-METHYL-2-NAPHTHYL)-4,6-DIALKOXY-5-SUBSTITUTED PHTHALIDES
Jerry Robert Daniel McCormick, Spring Valley, and Nancy Hazlett Arnold, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Aug. 19, 1969, Ser. No. 851,463
Int. Cl. C07d *5/38*
U.S. Cl. 260—343.3 **10 Claims**

This disclosure describes 3-(1,8-dimethoxy-4-methyl-2-naphthyl-4,6-dialkoxy-5-substituted phthalides useful as intermediates for the preparation of 6-methyl-1,3,10,11,12-pentahydroxynaphthacene-2-carboxamide.

3,577,440
1-SUBSTITUTED-3-AMIDO-PYRROLIDINES
Carl Dalton Lunsford and Grover Cleveland Helsley, Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.
No Drawing. Continuation-in-part of abandoned application Ser. No. 786,420, Dec. 23, 1968. This application Nov. 7, 1969, Ser. No. 874,986
Int. Cl. C07d *27/04*
U.S. Cl. 260—326.3 **15 Claims**

1-substituted-3-amidopyrrolidines useful as analgetics and anti-depressants are disclosed. The compounds are prepared by acylation of 1-substituted-3-aminopyrrolidines.

3,577,441
NITRO SUBSTITUTED BENZOFURANS
Daniel Kaminsky, East Paterson, Robert I. Meltzer, Rockaway, and John Shavel, Jr., Mendham, N.J., assignors to Warner-Lambert Pharmaceutical Company, Morris Plains, N.J.
No Drawing. Filed Mar. 7, 1967, Ser. No. 621,156
Int. Cl. C07d *5/42, 5/44*
U.S. Cl. 260—346.2 **3 Claims**

A novel method for the production of substituted benzofurans by reacting an activated halo compound with an oxime in the presence of a suitable base to obtain an oxime ether. The oxime ether is then treated to yield the benzofuran nucleus.

3,577,442
1-(DICARBOXYPHENYL)-INDANE DICARBOXYLIC ACID DIANHYDRIDE
Howard V. Holler, Oakland, Calif., assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed Nov. 12, 1968, Ser. No. 776,000
Int. Cl. C07c *63/48, 63/02*
U.S. Cl. 260—346.3 **2 Claims**

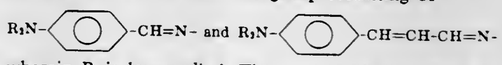
The novel compounds 1-(3',4'-dicarboxyphenyl)-1,3,3-trimethyl-5,6 and 6,7-indane dicarboxylic dianhydrides, useful as curing agents for epoxy resins, are prepared by the dehydration of the corresponding novel tetracarboxylic acids. The acids are formed by oxidation of the isomeric dimers of 1,2-dimethyl-4-isopropenylbenzene.

3,577,443
SEPARATION OF OLEFINS FROM EPOXIDES
Thomas A. Washall, Wilmington, Del., and Sidney Blittman, Philadelphia, Pa., assignors to Atlantic Richfield Company, New York, N.Y.
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,149
Int. Cl. C07d *1/12*
U.S. Cl. 260—348 **9 Claims**

C_6–C_{18} olefins are separated from C_6–C_{18} epoxides in mixtures wherein the boiling range of the epoxides overlaps the boiling range of the olefins utilizing a cyclic silica gel adsorption process.

3,577,444
SUBSTITUTED ANTHRAQUINONES
Nicholas J. Clecak, San Jose, and Robert J. Cox, Los Gatos, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
No Drawing. Filed Jan. 8, 1969, Ser. No. 789,928
Int. Cl. C07c *119/10*
U.S. Cl. 260—378 **3 Claims**

Anthraquinones having at the 2 and the 6 positions substituents selected from the group consisting of



wherein R is lower alkyl. The compounds are useful as dichroic photoconductors and as photosensitizers for photoconductive polymers such as polyvinylcarbazole.

3,577,445
19-NORSTEROIDAL 3-CHLORO-3,5-DIENES
Donald W. Oliver, West Chester, and Gerhard R. Wendt, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Filed Dec. 23, 1968, Ser. No. 786,374
Int. Cl. C07c *169/08*
U.S. Cl. 260—397.5 **1 Claim**

Novel 19-norsteroidal 3-chloro-3,5-dienes, particularly, 3-chloro-13-ethyl-17α-ethynyl (or chloroethynyl)gona-3,5-dien-17-ols (I) are provided by chloro/enolizing the corresponding gon-4-en-3-ones (II) with a reagent such as oxalyl chloride. Compounds I are pharmacologically active as bronchodilators and biocidally-active, as bactericides.

3,577,446

PHOSPHATIDYLALKANOLAMINE DERIVATIVES

Sumanas Rakhit, Dollard des Ormeaux, Quebec, Canada, assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Filed Sept. 9, 1968, Ser. No. 758,587

Int. Cl. A23j *7/00*

U.S. Cl. 260—403 **1 Claim**

There are disclosed herein phosphatidylalkanolamines in which the alkanolamine is 2-hydroxyethyl-, 2- or 3-hydroxypropyl-, or 3-hydroxybutylamine and the acyl groups contain from 18–20 carbon atoms and three or more double bonds. The compounds have anti-hypertensive properties, and methods for their preparation and use are also disclosed.

3,577,447

ALKANOYL DERIVATIVES OF FLUORINATED AMIDES

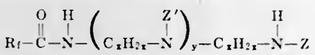
Richard F. Sweeney, Randolph Township, and Alson K. Price, Morris Township, Morris County, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Aug. 1, 1968, Ser. No. 749,316

Int. Cl. C09f *7/00*

U.S. Cl. 260—404.5 **18 Claims**

Alkanoyl derivatives of fluorinated amides useful as oil-repellency agents have the structural formula



wherein x and y are integers from 2 to 6 and 1 to 4, respectively; wherein R_f is a perfluoroalkyl or a fluorinated isoalkoxyalkyl radical; Z is H, alkyl, hydroxyalkyl, a fluorinated acyl radical R_fCO— wherein R_f is as described above, or a hydrocarbon acyl radical; Z′ is H, alkyl, hydroxyalkyl, a fluoroinated acyl radical R_fCO— wherein R_f is as described above, a hydrocarbon acyl radical or a radical of the formula —$C_xH_{2x}NHZ$ wherein x and Z are as described above, there being at least one fluorinated acyl radical R_fCO— and at least one hydrocarbon acyl radical in the molecule represented by Z and/or Z′.

ERRATUM

For Class 260—410.6 see:
Patent No. 3,577,559

3,577,448

BIS(CYCLOPENTADIENYL) COMPOUNDS OF VANADIUM

John F. Deffner, Glenshaw, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Filed Dec. 26, 1967, Ser. No. 693,057

Int. Cl. C07j *9/00;* **C08g** *7/04;* **C06d** *5/00*

U.S. Cl. 260—429 **14 Claims**

β - Diketonatobis(cyclopentadienyl)vanadium nitrates and perchlorates and β-diketonatobis (C_1–C_4 alkylcyclopentadienyl)vanadium nitrates and perchlorates are disclosed as new compounds useful in modifying the polymerization of an olefin such as styrene. Examples show that polymerization of styrene is accelerated by acetylacetonatobis(cyclopentadienyl)vanadium nitrate; acetylacetonatobis(methylcyclopentadienyl)vanadium perchlorate; 6-methyl - 2,4 - heptanedionatobis(methylcyclopentadienyl) vanadium nitrate; and 1,3-diphenyl-1,3-propanedionatobis (cyclopentadienyl)vanadium perchlorate. Polymerization of styrene is inhibited by 3,5-heptanedionatobis(cyclopentadienyl)vanadium perchlorate.

3,577,449

PROCESS FOR THE PREPARATION OF A COMBUSTION ADDITIVE

Charles I. Ashmore, Manassas, Va., assignor to Thiokol Chemical Corporation, Bristol, Pa.

No Drawing. Filed Jan. 7, 1969, Ser. No. 789,623

Int. Cl. C07j *15/02*

U.S. Cl. 260—439 **2 Claims**

A process for the preparation of 1,3-diferrocenyl-1-butene which comprises the mixing and reacting under the application of heat 1-ferrocenylethanol with acetic acid.

3,577,450

PROCESS FOR PREPARING METHYLENE BIS-(ALUMINUM DIHALIDES)

Morris R. Ort, Seabrook, Tex., and Edward H. Mottus, Ballwin, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Dec. 23, 1968, Ser. No. 786,449

Int. Cl. C07f *5/06*

U.S. Cl. 260—448 **3 Claims**

Aluminum, a methylene dihalide and the corresponding halogen are reacted to form a methylene bis-(aluminum dihalide) and there may be some by-product formed, which will contain an aluminum atom having only a single halogen atom attached. For example, when chlorine, methylene dichloride and aluminum are reacted, the following compounds are formed:

It is preferred that the halogen and aluminum be reacted in a ratio of about 1:1 on a gram-atom basis for optimum yields of the bis-aluminum compound, and it is preferred to use high purity aluminum, that all reactants be substantially moisture-free and the reaction be carried out in an inert atmosphere. It is preferred to carry the reaction out in the dark to inhibit the halogenation of the methylene dihalide, especially chlorination.

3,577,451

SULFAMIDE DERIVATIVES

Engelbert Kühle, Bergisch-Gladbach, Erich Klauke, Cologne-Flittard, Paul-Ernst Frohberger, Burscheid, Bezirk, Dusseldorf, and Hans Scheinpflug, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Jan. 20, 1967, Ser. No. 610,500

Claims priority, application Germany, Feb. 17, 1966, F 48,451

Int. Cl. C07c *143/00*

U.S. Cl. 260—453 **7 Claims**

The disclosure covers broadly N,N′-di(alkyl and/or alkenyl) - [N - mono(fluorodichloromethylmercapto) or N,N′ - di(fluorodichloromethylmercapto)] - sulfamides which possess fungicidal properties and which may be prepared by conventional procedures.

3,577,452

ORGANIC ESTERS OF BIVALENT SULFUR

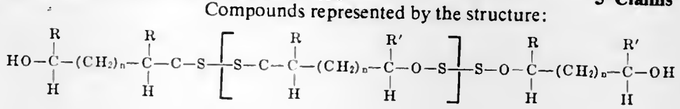
Quentin E. Thompson, Belleville, Ill., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Original application Dec. 28, 1964, Ser. No. 421,672, now Patent No. 3,357,993, dated Dec. 12, 1967. Divided and this application Aug. 10, 1967, Ser. No. 668,734

Int. Cl. C07c *145/00*

U.S. Cl. 260—456 **5 Claims**

Compounds represented by the structure:



where y is an integer from 0 to 10, R and R′ are each selected from the group consisting of hydrogen, alkyl radicals having from 1 to 16 carbon atoms, cycloalkyl radicals having from 5 to 6 carbon atoms, cycloalkylalkyl radicals having from 7 to 17 carbon atoms, alkenyl radicals having from 2 to 16 carbon atoms, providing that the total of the number of carbon atoms of R and R′ is not greater than 20, and aryl radicals and n is an integer from 0 to 16 and a method for preparing said compounds.

3,577,453

TRIFLUOROMETHYL PHENYL-N-(HALOPHENYL)-CARBAMATES AND PESTICIDAL PREPARATIONS CONTAINING SAME

Otto Rohr, Therwil, and Hans Rudolf Hitz, Muttenz, Switzerland, assignors to Ciba Limited, Basel, Switzerland

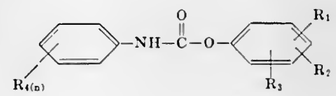
No Drawing. Continuation-in-part of application Ser. No. 351,234, Mar. 11, 1964. This application June 16, 1967, Ser. No. 646,449

Claims priority, application Switzerland, Mar. 15, 1963, 3,294/63

Int. Cl. C07c *125/06;* **A01n** *9/20*

U.S. Cl. 260—471 **3 Claims**

Compounds are provided of the formula



wherein R_1 represents hydrogen or halogen, alkyl with 1 to 4 carbon atoms, —NO_2, —CF_3 or —CN; R_2 represents hydrogen or halogen; R_3 represents alkyl containing 1 to 4 carbon atoms, —NO_2, —CF_3 or —CN, and R_4 represents halogen and n=1 or 2. The compounds of this invention are especially useful as pesticides for controlling bacteria and fungi.

3,577,454

PROCESS FOR CRYSTALLIZING BIS(β-HYDROXYETHYL)TEREPHTHALATE

Max H. Keck, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

No Drawing. Filed July 1, 1968, Ser. No. 741,312

Int. Cl. C07c *69/82*

U.S. Cl. 260—475 **4 Claims**

A process for purifying bis(β-hydroxyethyl)terephthalate by crystallization in which crystal modifying agents are added to solutions of the ester to induce formation of crystals of a size and shape that permits their recovery from the solution in pure state.

3,577,455

t-BUTYL-α-METHYL-γ-NITRO VALERATE

Robert E. Jones, North Muskegon, Mich., and Harold Reynolds, Kankakee, Ill., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Filed Feb. 10, 1966, Ser. No. 526,369

Int. Cl. C07c *69/24, 69/66, 103/08*

U.S. Cl. 260—478 **1 Claim**

t-Butyl-α-methyl-γ-nitro valerate useful as an intermediate in the preparation of a levulinic acid derivative which is useful in the preparation of non-steroidal anti-inflammatory agents.

3,577,456

PROCESS FOR THE MANUFACTURE OF AQUEOUS ALKALI PARAFFIN SULPHONATE SOLUTIONS CONTAINING SMALL AMOUNTS OF ALKALI SULFATE

Hans-Jerg Kleiner, Bad Soden, Taunus, and Karl Rehn, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Feb. 16, 1968, Ser. No. 705,904

Int. Cl. C07c *143/02, 139/14;* **B01f** *17/02*

U.S. Cl. 260—513 **6 Claims**

An aqueous solution of alkali paraffin sulphonates having a low content of alkali sulphate is obtained from sulphoxidation products by separating the main part of the hydrotropically dissolved paraffin by addition of a low molecular alcohol, neutralizing the aqueous-alcoholic solution with an alkali and separating the precipitated alkali sulphate.

3,577,457

PROCESS FOR PREPARING 4,4′-DICARBOXYBENZOPHENONE

Johann G. D. Schulz, Pittsburgh, Pa., assignor to Gulf Research and Development Company, Pittsburgh, Pa.

No Drawing. Filed July 19, 1968, Ser. No. 745,962

Int. Cl. C07c *65/20*

U.S. Cl. 260—517 **13 Claims**

A process for preparing purified 4,4′-dicarboxybenzophenone which invloves treating a mixture containing 4,4′-dicarboxybenzophenone and impurities with methanol or ethylene glycol at a temperature below about 85° C., whereby the 4,4′-dicarboxybenzophenone remains unaffected but the impurities are removed.

3,577,458

PROCESS FOR THE PREPARATION OF ISOCYANATES

Arthur M. Brownstein, Morristown, and John P. Sibilla, Livingston, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Original application Nov. 14, 1966, Ser. No. 593,668, now Patent No. 3,465,024, dated Sept. 2, 1969. Divided and this application Feb. 3, 1969, Ser. No. 828,024

Int. Cl. C07c *119/00*

U.S. Cl. 260—545 **3 Claims**

This invention is directed to the diacetate ester of certain dihydroxamic acids; said acetate esters can be decomposed to form isocyanates.

3,577,459

N-ALKYL AND N,N-DIALKYL ALKANESULFONAMIDE BIS(ALKYLIMINES) AND N-ALKYL AND N,N-DIALKYL ALKYLIMINES AND PROCESSES FOR PREPARING SAME

Robert G. Laughlin, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed May 20, 1968, Ser. No. 730,637

Int. Cl. C01c *145/00*

U.S. Cl. 260—551 **17 Claims**

Novel N-alkyl and N,N-dialkyl alkanesulfonamide bis-(alkylimine) and N-alkyl and N,N-dialkyl alkanesulfonamide alkylimine compounds and novel processes for their preparation. These compounds have utility as extreme pressure lubricant additives, as anti-microbial agents and as accelerators in the synthesis of rubber.

3,577,460
SYNTHESIS OF PERFLUOROISOPROPYLIDENIMINE
Robert A. Falk, Rockaway, N.J., assignor to Thiokol Chemical Corporation, Bristol, Pa.
Filed Nov. 7, 1968, Ser. No. 774,161
Int. Cl. C07c *119/00*
U.S. Cl. 260—566 **6 Claims**

The compound perfluoroisopropylidenimine,

$$(CF_3)_2C{=}NF$$

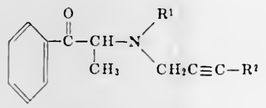
is prepared by a novel method comprising treating

$$(CF_3)_2CFI$$

with N_2F_4 to form $(CF_3)_2CFNF_2$ and defluorinating the latter product with ferrocene to form $(CF_3)_2C{=}NF$. The compound $(CF_3)_2C{=}NF$ is useful as a monomer, which form copolymers with tetrafluoroethylene useful in preparing extruded and molded plastic bodies.

3,577,461
α-PROPARGYLAMINO-PROPIO-PHENONES AND THE SALTS THEREOF
Edward John Warawa, 2575 N. 37th St., and John Hans Biel (522 Green Bay Road, Lake Bluff, Ill.), both of Milwaukee, Wis. 53210
No Drawing. Filed Oct. 10, 1968, Ser. No. 766,626
Int. Cl. C07c *97/10*
U.S. Cl. 260—570.5 **9 Claims**

α-Propargylaminopropiophenone derivatives of the formula



wherein R^1 is (lower)alkyl, (lower)alkenyl, (lower) alkynyl, benzyl, cyclopropyl or cyclopropylmethyl and R^2 is hydrogen, (lower)alkyl, phenyl or benzyl; and the pharmaceutically acceptable nontoxic salts thereof exhibit central nervous system stimulant activity and anorexic activity and are useful as central nervous system stimulants and to inhibit appetite in mammals.

3,577,462
N-ARYLALKYL-β-HYDROXY-β-PHENYL-ETHYLAMINES AND THE SALTS THEREOF
William F. Bruce, Havertown, Pa., assignor to American Home Products Corporation, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 502,370, Oct. 22, 1965. This application Aug. 8, 1968, Ser. No. 751,028
Int. Cl. C07c *91/22*
U.S. Cl. 260—570.6 **6 Claims**

Diaralkylamines are prepared by prolonged reaction of styrene oxide with dialkylaminoalkyl, hydroxyalkyl, halobenzyl, and heteroalkyl amines. The compounds show central nervous system depressant activity.

3,577,463
SYNTHESIS OF STEROIDS
Patrick A. Diassi, Westfield, N.J., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.
No Drawing. Application June 11, 1968, Ser. No. 736,028, now Patent No. 3,449,378, dated June 10, 1969, which is a continuation-in-part of application Ser. No. 370,114, May 25, 1964. Divided and this application Jan. 16, 1969, Ser. No. 791,794
Int. Cl. C07c *49/00*
U.S. Cl. 260—586 **3 Claims**

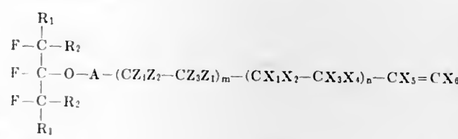
This invention relates to and has as its object the provision of new physiologically active steroids, processes for their production and novel intermediates useful in the preparation thereof.

3,577,464
POLYENE COMPOUNDS AS COLORING AGENTS
Hugo Gutmann, Reinach, Ulrich Manz, Basel, and Ulrich Schwieter, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed Jan. 11, 1967, Ser. No. 608,487
Claims priority, application Switzerland, Jan. 21, 1966, 856/66
Int. Cl. C07c *45/00*
U.S. Cl. 260—601 **4 Claims**

Conjugated polyene dialdehyde compounds having 14–44 carbon atoms and mixtures thereof which are useful as coloring agents for foodstuffs, pharmaceutical preparations and cosmetic preparations and a method for preparing these dialdehydes including various intermediates in this method. This method is carried out by reacting a phosphonium salt of a conjugated aliphatic olefine having a terminal aldehyde radical with a conjugated aliphatic olefine having a terminal acetal linkage radical and terminal aldehyde radical and thereafter hydrolyzing the reaction product to produce the dialdehyde. This dialdehyde may be further chain lengthened by reacting this dialdehyde with a phosphonium salt of a conjugated olefine having a terminal aldehyde radical, or by reacting with a vinyl ether or propenyl ether.

3,577,465
TERMINALLY UNSATURATED FLUOROOLEFINS
Louis Gene Anello, Basking Ridge, and Richard Francis Sweeney, Dover, N.J., and Morton Herbert Litt, University Heights, Cleveland, Ohio, assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 633,359, Apr. 25, 1967. This application Apr. 12, 1968, Ser. No. 721,113
Int. Cl. C07c *43/00*
U.S. Cl. 260—614 **5 Claims**

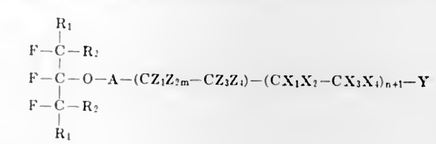
Terminally unsaturated polyfluoroolefinic compounds of the formula



wherein R_1 and R_2 are Cl, F, alkyl, haloalkyl, or alkylene and haloalkylene groups forming a cycloaliphatic structure, wherein A represents alkylene or haloalkylene groups, wherein $—(CZ_1Z_2—CZ_3Z_4)—$ and

$$—(CX_1X_2—CX_3X_4)—$$

wherein Z_1–Z_4 may be selected from H, F, Cl and perhalomethyl groups, wherein Z_2 and Z_4 may additionally be selected from haloalkyl groups and aralkyl groups and alkyl or haloalkyl which may be interrupted with ether linkages; and X_1–X_7 may be selected from H, F and Cl groups; are bifunctional groups derived from certain telomerizable unsaturated compounds, wherein *m* and *n* are integers of from 0 to 75, and wherein $—CX_5{=}CX_6X_7$ is derived from bifunctional group $—(CX_1X_2—CX_3X_4)—$ are prepared from polyfluorohalides of the formula



wherein Y is H or a halogen and R_1, R_2, A, Z_1–Z_4, X_1–X_4, *m* and *n* are as defined above by methods such as dehydrohalogenation or dehalogenation of the terminal

$$—(CX_1X_2—CX_3X_4)—Y$$

group. These terminally unsaturated fluoro-olefinic compounds are useful as intermediates for the preparation of fluorocarbon acids of art recognized utility.

3,577,466
PRODUCTION OF ALLYLIC ETHERS
Kenzie Nozaki, El Cerrito, Calif., assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed July 30, 1968, Ser. No. 748,652
Int. Cl. C07c *43/14*
U.S. Cl. 260—614 **9 Claims**

Production of allylic ethers by reacting in high conversion an allylic alcohol of the formula

$$R—CH{=}CH—CHR'—OH$$

where R is hydrogen, methyl or hydroxymethyl and R′ is hydrogen or methyl, with itself or with a nonallylic alcohol in the presence as catalyst of cupric chloride or bromide or additionally in the presence as catalyst promoter of an acidic material or an allylic halide, where the halide is chloride or bromide.

3,577,467
PROCESS FOR THE HYDROLYSIS OF LIGNIN
Irving S. Goldstein, Downers Grove, and Joseph D. Benigni, Chicago, Ill., assignors to Continental Can Company, Inc., New York, N.Y.
No Drawing. Filed May 29, 1968, Ser. No. 732,836
Int. Cl. C07c *37/28*
U.S. Cl. 260—627 **5 Claims**

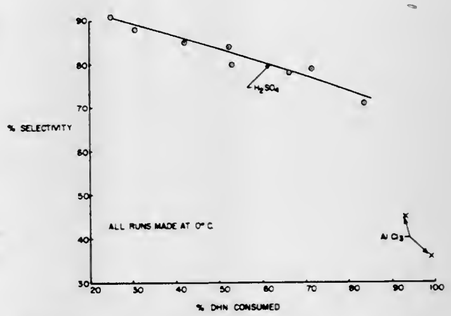
High yields of low molecular weight phenolic substances are obtained by heating, at 250° to 380° C. for 3 to 45 minutes, a slurry of water and a lignin material separated from the liquor resulting from the alkaline pulping of lignocellulose, and then recovering the phenolic materials from the reaction mixture.

3,577,468
MONOHALOGENATION OF ALKYL-ADAMANTANE HYDROCARBONS
Abraham Schneider, Overbrook Hills, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Mar. 26, 1968, Ser. No. 715,958
Int. Cl. C07c *17/10*
U.S. Cl. 260—648 **18 Claims**

C_{11}–C_{20} alkyladamantane hydrocarbons are monochlorinated, monobrominated or monofluorinated at an unsubstituted bridgehead position by reacting the same at —30° C. to 10° C. with a C_4–C_5 tertiary alkyl chloride, bromide or fluoride, using as catalyst 90–100% sulfuric acid or 90–100% hydrofluoric acid. The corresponding 1-haloalkyladamantane is obtained with little if any other reaction products.

3,577,469
PREPARATION OF 9-HALODECAHYDRONAPHTHALENE
Abraham Schneider, Overbrook Hills, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
Filed May 2, 1968, Ser. No. 726,132
Int. Cl. C07c *7/10, 23/36*
U.S. Cl. 260—648 **15 Claims**

Cis-decahydronaphthalene is converted to trans-9-chlorodecahydronaphthalene, or to the corresponding bromine or fluorine analogue, in a highly selective reaction with C_4–C_5 tertiary alkyl chloride, bromide or fluoride. The reaction is effected by contacting a mixture of the



reactants with 90–100% H_2SO_4 at —20° C. to 25° C., preferably at —10° C. to 10° C.

3,577,470
PROCESS FOR PREPARING 1,3,5-HALOXYLENE
John D. Bacha, Monroeville, and Charles M. Selwitz, Pitcairn, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed Dec. 20, 1968, Ser. No. 785,798
Int. Cl. C07c *25/04*
U.S. Cl. 260—650 **4 Claims**

A process for isomerizing a haloxylene to a 1,3,5-haloxylene which involves contacting such haloxylene charge with hydrogen fluoride and boron trifluoride, preferably in the presence of ortho-halotoluene.

3,577,471
HALOGEN INTERCHANGE PROCESS
John G. McNulty and William L. Walsh, Glenshaw, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed Feb. 1, 1968, Ser. No. 702,214
Int. Cl. C07c *21/02*
U.S. Cl. 260—656 **5 Claims**

Halides can be made to undergo transhalogenation in a process wherein two compounds containing different halogen substituents are contacted at elevated temperatures. By this process, organic halides, such as vinyl bromide and dibromoethane, can be directly converted to vinyl chloride by contact with a suitable halide such as hydrogen chloride. Ethylene, which is easily brominated, can thus readily be converted to vinyl chloride.

3,577,472
METHOD FOR CHLORINATING PARAFFINS
John C. Jubin, Jr., Wallingford, and Matthew L. Becker, Philadelphia, Pa., assignors to Atlantic Richfield Company, Philadelphia, Pa.
No Drawing. Filed May 28, 1968, Ser. No. 732,507
Int. Cl. C07c *17/10*
U.S. Cl. 260—660 **7 Claims**

Paraffins are chlorinated to avoid production of dark colored impurities and to maintain maximum selectivity for the production of monochloroparaffins by admixing the chlorine with a portion of the cold paraffin charge and thereafter combining this cold chlorine-containing stream with the remainder of the charge paraffin which has been heated to a temperature above the desired reaction initiation temperature.

3,577,473
METHOD FOR PRODUCING 5-ISOPROPYLIDENE-2-NORBORNENE

Tsuneyuki Nagase, Gohu Suzukamo, Fujio Masuko, and Yukio Yoneyoshi, Takatsuki-shi, Masami Fukao, Ibaragi-shi, and Masahiro Fujiwara, Takatsuki-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

No Drawing. Filed Oct. 4, 1968, Ser. No. 764,995
Claims priority, application Japan, Dec. 25, 1967, 42/68,966; Jan. 23, 1968, 43/3,900, 43/3,902; Jan. 24, 1968, 43/4,490
Int. Cl. C07c *5/24*
U.S. Cl. 260—666 **15 Claims**

5-isopropylidene-2-norbornene is produced by subjecting cyclopentadiene and 2-methyl-3-butene-2-ol to Diels-Alder reaction to obtain α,α-dimethyl-5-norbornene-2-methanol (a mixture of endo-form and exo-form), dehydrating the α,α-dimethyl-5-norbornene-2-methanol to form a mixture of endo- and exo-5-isopropenyl-2-norbornene mixture containing, in part, 5-isopropylidene-2-norbornene, and contacting the mixture with an alkaline catalyst.

The 5-isopropylidene-2-norbornene is useful as a termonomer of a so-called ethylene-propylene terpolymer rubber, and the incorporation thereof results in a terpolymer having excellent curing characteristics.

3,577,474
CONVERSION OF C_6—C_7 CYCLOALKANES TO BENZENE AND TOLUENE

Robert L. Jacobson, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 18, 1968, Ser. No. 776,533
Int. Cl. C07c *15/04*
U.S. Cl. 260—668 **7 Claims**

High conversion of C_6–C_7 cycloalkanes to aromatics is obtained by contacting the cycloalkanes in the presence of hydrogen with a catalyst comprising 0.01 to 3 weight percent platinum and 0.01 to 5 weight percent rhenium in association with a porous inorganic oxide carrier and maintaining the conversion conditions sufficiently severe to convert at least 85 percent, and preferably 90 percent, of the cycloalkanes to aromatics and alkanes.

3,577,475
ISOMERIZATION OF C_8 ALKYL AROMATICS

Sigmund M. Csicsery, Lafayette, Calif., assignor to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Jan. 30, 1969, Ser. No. 795,359
Int. Cl. C07c *5/24, 15/08*
U.S. Cl. 260—668 **6 Claims**

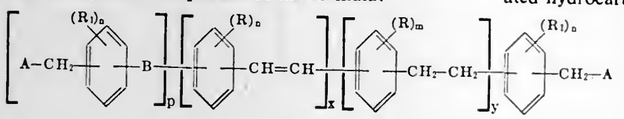
C_8 alkyl aromatic hydrocarbons are isomerized under isomerization conditions and in the presence of hydrogen with a catalyst comprising a porous solid carrier containing from 0.01 to 3 weight percent of a platinum group component and from 0.01 to 5 weight percent of a rhenium component.

3,577,476
ARYLENE AND ARLIDENE POLYMERS AND COPOLYMERS

John A. Gurney, Tarrytown, N.Y., and Luther A. R. Hall, Woodcliff Lake, N.J., assignors to Geigy Chemical Corporation, Ardsley, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 529,214, Feb. 23, 1966. This application Feb. 18, 1969, Ser. No. 800,269
Int. Cl. C07c *15/02*
U.S. Cl. 260—668 **15 Claims**

The compounds are of the class of aromatic polymeric and copolymeric compounds of the formula:



The polymeric and copolymeric compounds relate also to hydrocarbons wherein R, R_1, *n*, *m*, *x*, *y*, B, *p*, and A are as defined below. These compounds are useful as color pigments for paints, fibers and motor oil, and as color pH-indicators. They are prepared by treating dihalomethyl benzene derivatives with (a) a tertiary amine and alkaline agent; or (b) an alkali metal amide in the presence of liquid ammonia; or (c) a tertiary amine and gaseous iodine. Illustrative embodiments are poly(trimethylmesitylidene) and poly(radialene).

3,577,477
PROCESS FOR CONVERTING SATURATED HYDROCARBONS TO UNSATURATED HYDROCARBONS BY OXIDATION

Pierre Boutry, Port Marly, Jean Claude Daumas, Marly-le-Roi, and Roger Montarnal, Mareil Marly, France, assignors to Institut Francais du Petrole, des Carburants et Lubrifiants, Rueil Malmaison, Hauts-de-Seine, France

No Drawing. Filed Jan. 3, 1969, Ser. No. 788,923
Claims priority, application France, Jan. 10, 1968, 135,566
Int. Cl. C07c *11/22, 5/18, 3/28*
U.S. Cl. 260—683.3 **15 Claims**

A process for oxidizing saturated hydrocarbons to olefins and/or dienes, without the substantial formation of oxygen-containing by-products, due to the control of the amount of oxygen used during the oxidation reaction and the selection of particular conditions for manufacturing the catalyst.

3,577,478
GRAFT POLYMER OF A VINYL MONOMER AND A POLYESTER, AND A BUTADIENE POLYMER

Donald H. Thorpe, Williamsville, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 544,817, Apr. 25, 1966. This application Nov. 12, 1968, Ser. No. 775,161
Int. Cl. C08f *43/08;* **C08g** *39/10*
U.S. Cl. 260—862 **39 Claims**

Graft copolymers are produced by reacting a polymerizable monomer with a polyester of a polycarboxylic compound and a polyhydric alcohol, wherein the polyester comprises a maximum of 5 mole percent of carboxylic and hydric components which contains aliphatic carbon-to-carbon unsaturation. Halogen-containing polyesters and phosphorus-containing polyesters are particularly useful in producing fire-retardant graft copolymers. The graft copolymers can be blended with a polymer of butadiene, such as a graft copolymer of a polymerizable monomer and polybutadiene to produce additional products. The polymer products are suitable for producing molded articles, laminates, extruded products, protective coatings, and the like, which have superior toughness, high-impact strength, fire resistance and chemical resistance.

3,577,479
ALUMINUM HALIDE ISOMERIZATION OF SATURATED HYDROCARBONS

Donald E. Jost, Media, Edward J. Janoski, Havertown, and Abraham Schneider, Philadelphia, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

No Drawing. Filed Aug. 9, 1968, Ser. No. 751,360
Int. Cl. C07c *5/28*
U.S. Cl. 260—683.75 **8 Claims**

In the isomerization of C_4–C_7 paraffins with an aluminum halide catalyst in the presence of an inert halogenated hydrocarbon solvent, it has been found that the rate

of isomerization and percentage yield is significantly increased when the solvent is present in amounts of from 10–50 volume percent based on the volume of the hydrocarbon feedstuff, and when, further, the aluminum halide catalyst is present in amounts in excess of what would be soluble in the solvent and paraffin feedstuff at the temperature employed.

3,577,480
GRAFT POLYMER OF A VINYL MONOMER AND A FIRE RETARDANT POLYESTER

Donald H. Thorpe, Williamsville, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 544,816, Apr. 25, 1966. This application Nov. 12, 1968, Ser. No. 775,160
Int. Cl. C08f *21/00;* **C09k** *3/28*
U.S. Cl. 260—869 **34 Claims**

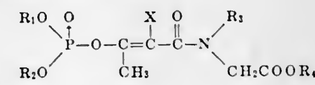
Graft copolymers are produced by reacting a polymerizable monomer with a polyester of a polycarboxylic compound and a polyhydric alcohol, wherein the polyester comprises a maximum of 5 mole percent of carboxylic and hydric components which contains aliphatic carbon-to-carbon unsaturation. Halogen-containing polyesters and phosphorus-containing polyesters are particularly useful in producing fire-retardant graft copolymers. The graft copolymers can be blended with a polymer of butadiene, such as a graft copolymer of a polymerizable monomer and polybutadiene to produce additional useful products. The polymer products are suitable for producing molded articles, laminates, extruded products, protective coatings, and the like, which have superior toughness, high-impact strength, fire resistance and chemical resistance.

3,577,481
PHOSPHORIC ACID ESTERS

Max Schuler, Arlesheim, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz AG), Basel, Switzerland

No Drawing. Continuation-in-part of application Ser. No. 715,138, Mar. 22, 1968. This application Nov. 12, 1969, Ser. No. 876,102
Claims priority, application Switzerland, Apr. 3, 1967, 4,689/67
Int. A01n *9/36;* **C07f** *9/08*
U.S. Cl. 260—942 **10 Claims**

Compounds of the Formula I



(I)

wherein

each of R_1 and R_2 represents a methyl or ethyl radical,
each of R_3 and R_4 represents an alkyl radical with 1 to 4 carbon atoms, and
X represents a hydrogen or halogen atom,

are exemplified and their use as pest combating agents in plant cultivation is given; specific pesticidal effects tested are those against *Bruchidius obtectus, Ephestia* (*Anagesta*) *kuehniella, Aphis fabae* and *Tetranychus telarius* as well as toxicity comparison studies on rats.

3,577,482
PROCESS FOR THE PREPARATION OF THIONOPHOSPHONATES

Delbert L. Hanna, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

No Drawing. Filed May 31, 1968, Ser. No. 733,331
Int. Cl. C07f *9/40*
U.S. Cl. 260—973 **5 Claims**

A process for preparing an O-alkyl-O-phenyl phenylthionophosphonate which comprises

(a) reacting a phenylthionophosphonoyl dihalide with an alkanol in the presence of trimethylamine and,
(b) reacting the resulting intermediate reaction mixture with a phenol in the presence of trimethylamine, and thereafter recovering the desired product.

ERRATUM

For Class 264—8 see:
Patent No. 3,577,560

3,577,483
PROCESS FOR THE PREPARATION OF PHOSPHORIC ACID ESTERS BY REACTION OF PHOSPHORUS OXYCHLORIDE WITH ALKYLENE OXIDES

Arnold Kotzschmar, Burgkirchen (Alz), Hermann Metzger, Burghausen (Salzach), and Richard Reinhard Gustav Adolf Rothe, deceased, late of Altotting, by Rudolfine Rothe, nee Roessler, heiress, Altotting, and Willy Seidel, Burgkirchen (Alz), Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

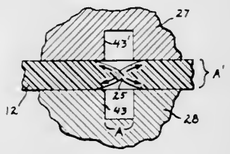
No Drawing. Filed Aug. 9, 1967, Ser. No. 659,533
Claims priority, application Germany, Aug. 13, 1966, F 49,943, Patent 1,290,532
Int. Cl. C07f *9/08;* **C08f** *45/58*
U.S. Cl. 260—977 **5 Claims**

Process for the continuous preparation of phosphoric acid esters having utility as plasticizers and for imparting flame resistant properties by reaction of phosphorus oxychloride with alkylene oxides, in which a large amount of the final product is used as reaction medium. The products produced according to the process of the present invention are superior to the discontinuously prepared esters because they have an extraordinarily low acid value.

3,577,484
METHOD FOR FORMING LINES OF WEAKNESS IN THERMOPLASTIC

William P. Jacobson, Rockford, Ill., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.

Filed Feb. 27, 1969, Ser. No. 802,781
Int. Cl. B29c *25/00;* **B29d** *7/22*
U.S. Cl. 264—92 **9 Claims**

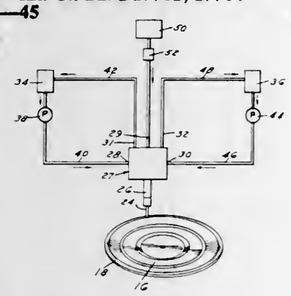


A line of weakness is formed in a sheet of thermoplastic which has been heated to render it soft and flowable by the disclosed method of cooling the surface of the heated sheet but not at the desired line of weakness and shrinking the sheet away from said line to reduce the thickness thereat. The line of weakness may be a fold line or a tear line, both of which are utilized in the disclosed carton. A carton blank is formed by apparatus which includes opposed heating heads, opposed forming heads and a trimming station. The forming heads have grooves in their surfaces at the desired location of the lines of weakness. Mechanisms are provided for cooling the forming heads and for drawing a vacuum on the grooves.

3,577,485
METHOD FOR PREPARATION OF CARBONITRIDE NUCLEAR FUEL MATERIALS
Ronald L. Beatty, Oak Ridge, James M. Leitnaker, Kingston, and Karl J. Notz, Jr., Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission
No Drawing. Filed Feb. 3, 1969, Ser. No. 796,175
Int. Cl. G21c *21/00*
U.S. Cl. 264—.5 **7 Claims**

A rapid method for converting actinide oxide-carbon particles to actinide carbonitride is given and comprises contacting the actinide oxide-carbon particles with nitrogen in a fluidized bed furnace at elevated temperatures.

3,577,486
METHOD OF FORMING AN AIR CLEANER SEAL
Joseph B. Sebok, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Sept. 20, 1968, Ser. No. 761,226
Int. Cl. B29d *27/02, 27/04*
U.S. Cl. 264—45 **6 Claims**



Liquid curable to elastic polyvinylchloride, polybutadiene or polyurethane is dispensed into a groove near the periphery of an air cleaner cover while the cover is rotating at about one revolution per second through a finite number of revolutions. A subsequent application of heat simultaneously cures the liquid and bonds the resulting seal to the cover.

ERRATUM

For Class 264—53 see:
Patent No. 3,577,360

3,577,487
PREPARATION OF SUBMICRON SIZED ALKALINE EARTH TITANATE AND ZIRCONATE POWDERS
Moises Gali Sanchez, Severna Park, Newton Levy, Jr., Ellicott City, and Richard R. Rettew, Laurel, Md., assignors to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed May 22, 1968, Ser. No. 731,306
Int. Cl. C04b *33/32;* **F27b** *9/04*
U.S. Cl. 264—56 **4 Claims**

Highly reactive, high purity, submicron sized alkaline earth titanates and zirconates are prepared by first blending hydroxides, nitrates, etc. and hydrogels and then passing the resulting product through a fluid energy mill.

3,577,488
MANUFACTURE OF PLASTIC TUBULAR FILM
Bernard K. Bigland, Radcliffe, Manchester, England, assignor to General Engineering Company (Radcliffe) Limited
Continuation-in-part of application Ser. No. 557,581, June 14, 1966. This application July 15, 1969, Ser. No. 841,871
Claims priority, application Great Britain, June 15, 1965, 25,190/65
Int. Cl. B29d *7/24*
U.S. Cl. 264—95 **6 Claims**

A method of forming an extruded tube of plastic material comprising extruding the material in a semi-molten state as a tubular film, having a wall of greater thickness than that of the finished tube, locating a first former within the tube near the extrusion point, passing the film over the face of the former in close proximity thereto, locating a second former at a point more remote from the extrusion point, passing the film over the face of the second former in close proximity thereto, directing a high velocity stream of air against the inner face of the film from below the first former and creating a further high velocity stream of air against the inner face of the film and between it and the second former, extracting air from the space between the two formers to maintain the air pressure in said space between the formers at or below atmospheric pressure, said streams of air moving at a velocity sufficient to prevent actual contact between the film and the formers, and arranging that the freeze zone of the film is in the region of maximum diameter of the second former and preferably between the position of maximum diameter and the downstream end thereof. The diameter of the tube being extruded can be varied by varying the diameter of the second former. In order to obtain still greater speeds of extrusion external cooling can be applied.

3,577,489
METHOD FOR AGGLOMERATING SUSPENDED PARTICLES
Christian Rosenthal, Munich, Germany, assignor to Chemische Werke Munich Otto Barlocher G.m.b.H., Munich, Germany
No Drawing. Continuation-in-part of application Ser. No. 649,088, June 26, 1967. This application Apr. 26, 1968, Ser. No. 725,271
Claims priority, application Germany, June 28, 1966, C 39,466; July 1, 1966, C 39,506; Sept. 16, 1966, C 40,148; Mar. 9, 1967, C 41,719; Apr. 28, 1967, C 42,182
Int. Cl. B01j *2/10*
U.S. Cl. 264—117 **13 Claims**

A plurality of finely subdivided solid particles is converted into a mass of distinct agglomerated bodies by suspending the solid subdivided particles in water heated to at least 80° C. The particles must be such that water is inert thereto and which are at most slightly soluble in water. The granulating agent is a synthetic organic plastic which is dissolved in a liquid organic solvent at at least 80° C. The granulating solution is then added to the suspension and the thus-formed mixture is maintained, preferably under stirring, at an elevated temperature below 100° C. and sufficiently high to form granules of the finely subdivided particles and the granulating agent so that a plurality of agglomerated bodies each comprising a plurality of the finely subdivided particles adhered to each other by the granulating agent will be obtained.

3,577,490
EFFERVESCENT TABLET AND PROCESS FOR MAKING SAME
Thomas Laurence Welsh, Donald Leroy Peterson, Blasey Thomas Palermo, and George Carr Hoss, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.
No Drawing. Original application Oct. 10, 1967, Ser. No. 671,948, now Patent No. 3,518,343, dated June 30, 1970. Divided and this application Dec. 29, 1969, Ser. No. 1,923
Int. Cl. A61j *3/10;* **A61k** *7/16*
U.S. Cl. 264—120 **9 Claims**

An effervescent tablet is produced by preparing a powdered tabletable composition comprising an effervescent couple, an antimicrobial substance, a tableting lubricant, and preferably, a flavoring, sweetening and/or coloring agent, mixing the same to achieve uniformity, and compressing into coherent tablet form. The lubricant can be fumaric acid or particles of a liquid lubricant coated with an oil-insoluble film-forming substance. Upon dissolution, a solution having antimicrobial properties is produced. The solution is useful for cleaning solid surfaces, particularly, the teeth and periodontal gum areas of the oral cavity.

3,577,491
TABLETING
Peter Henry Cox, Oss, Netherlands, assignor to Miles Laboratories Incorporated, Elkhart, Ind.
No Drawing. Original application Jan. 2, 1968, Ser. No. 694,890, now Patent No. 3,518,346, dated June 30, 1970. Divided and this application Dec. 29, 1969, Ser. No. 1,924
Int. Cl. A61j *3/10;* **A61k** *7/16*
U.S. Cl. 264—120 **7 Claims**

An improvement in the process of compressing powdered tabletable compositions is gained by mixing fumaric acid with said composition prior to compression. The fumaric acid acts as a surface lubricant and as an internal compression lubricant for said tabletable compositions. The powdered tabletable compositions lubricated with fumaric acid can be those intended for internal employment such as for alkalizing of the stomach or intended for external use such as for general cleaning of solid surfaces.

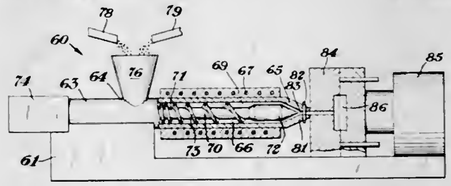
3,577,492
TABLETING LUBRICANT
Thomas Laurence Welsh and George Ronald Tomaich, Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.
No Drawing. Original application Oct. 2, 1967, Ser. No. 672,004, now Patent No. 3,518,344, dated June 30, 1970. Divided and this application Dec. 29, 1969, Ser. No. 1,944
Int. Cl. A61j *3/10;* **A61k** *7/16*
U.S. Cl. 264—120 **6 Claim**

An improvement in the process of compressing powdered tabletable materials is gained by mixing with said materials prior to tableting, a lubricant comprising, in combination, a siloxane polymer and dry-mixable particles of a lubricating oil coated with an oil-insoluble film-forming substance. The lubricant acts as both a punch face lubricant and as a diewall lubricant for said tabletable materials. The powdered tabletable materials lubricated with the above lubricant can be those intended for general cleaning of solid surfaces or those intended for therapeutic employments.

3,577,493
METHOD OF FABRICATING A GLASS FABRIC LAMINATE MATERIAL
Henry J. Lee, Cherry Hill, N.J., assignor to the United States of America as represented by the Secretary of the Navy
No Drawing. Filed Oct. 30, 1968, Ser. No. 772,012
Int. Cl. B29g *1/00, 5/00*
U.S. Cl. 264—137 **2 Claims**

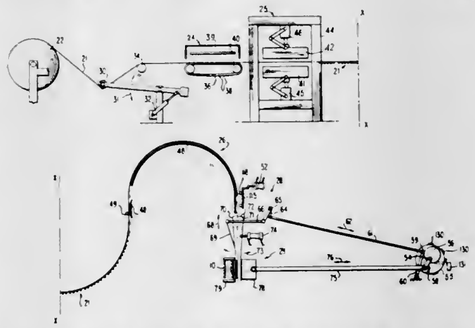
The present invention relates to a novel and improved method of synthesizing a polyurethane polymer which has outstanding chemical and mechanical properties and which is particularly useful as an adhesive resin in a glass cloth reinforced laminate material. The improved process utilizes the ability of aromatic polyisocyanates to dimerize and trimerize and react with a short chain aliphatic glycol under carfully controlled conditions of heat to form a unique prepolymer that is subsequently cured at a specified temperature.

3,577,494
METHOD FOR THE PREPARATION OF EXTRUDABLE SYNTHETIC RESINOUS MATERIALS
Douglas S. Chisholm and James K. Rieke, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of application Ser. No. 796,937, Oct. 31, 1968, which is a continuation-in-part of application Ser. No. 677,440, Oct. 23, 1967. This application Sept. 5, 1969, Ser. No. 857,298
Int. Cl. B28b *3/22*
U.S. Cl. 264—143 **10 Claims**



Improved feed of granular synthetic resinous material in screw extruders is obtained and fiber breakage is significantly reduced when chopped glass fiber and extrudable resin are mixed in an extruder having an increasing working volume screw. The product has significantly improved impact strength.

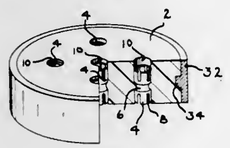
3,577,495
EGG CARTON FORMING METHOD
David L. Pearl, 55 Enterprise Blvd. SW., Atlanta, Ga. 30336; Beverly P. Head, Jr., 3528 Victoria Road, Birmingham, Ala. 35223; and John G. Waller, 1429 E. Cambridge Ave., College Park, Ga. 30337
Filed July 28, 1969, Ser. No. 845,462
Int. Cl. B26d *1/56;* **B29c** *17/10*
U.S. Cl. 264—153 **7 Claims**



An egg carton forming method wherein a sheet of polystyrene is passed through a predetermined path where the

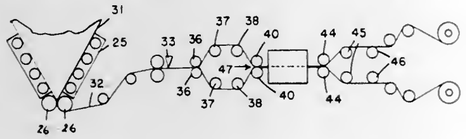
sheet is heated at a first station. A plurality of egg carton impressions each complete with egg tray, lid and locking flap are formed across the width of the sheet at a second station. Latching holes are punched in the lid impressions at a third station, and the egg carton impressions are cut away from the sheet of material at a fourth station.

3,577,496
METHOD OF MAKING A SEALED ELECTRICAL CONNECTING DEVICE
Norman Edwin Hoffman, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Original application Sept. 23, 1965, Ser. No. 489,697, now Patent No. 3,409,864, dated Nov. 5, 1968. Divided and this application Mar. 21, 1968, Ser. No. 714,829
Int. Cl. B29c *27/16, 27/20*
U.S. Cl. 264—156 **1 Claim**



A sealed assembly is provided and comprises a member formed of thermoplastic material having memory characteristics. An opening extends through the member for receiving an electrical contact, which contact is sealed in place by internal forces within the thermoplastic member. Additional means are provided for surrounding the member and for providing a seal therebetween due to thermal expansion of the member.

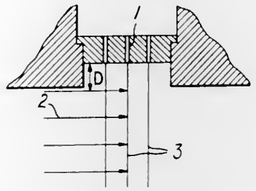
3,577,497
METHOD FOR HEAT-SETTING BIAXIALLY STRETCHED FILMS OF THERMOPLASTIC MATERIALS
Tomoyuki Matsugu, Ryota Notomi, and Teruchika Kanoh, Shizuoka-ken, Japan, assignors to Kohjin Company Limited, Tokyo, Japan
Filed Apr. 28, 1969, Ser. No. 819,549
Int. Cl. B29c *25/00*
U.S. Cl. 264—159 **6 Claims**



Simultaneously heat-setting of a pair of flat, biaxially oriented films formed of thermoplastic material. Maintaining the films in spaced apart relationship during the heat-setting procedure.

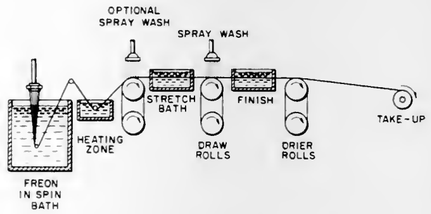
3,577,498
METHOD OF PRODUCING CRIMPED POLYPROPYLENE FIBERS
Tatsuki Matsuo, Shosuke Nanri, and Ryunosuke Masuda, Otsu, Hikoyuki Uchihashi, Moriguchi, and Katsuya Ishitobi, Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan
Continuation-in-part of abandoned application Ser. No. 678,616, Oct. 27, 1967. This application Oct. 25, 1968, Ser. No. 770,776
Claims priority, application Japan, Nov. 1, 1966, 41/72,222
Int. Cl. D01d *5/22*
U.S. Cl. 264—168 **10 Claims**

Bulky crimped polypropylene fibers, the coil crimps of which have a coil diameter of e.g. less than 0.7 mm., and are of good reproducibility, are made by cooling or quenching polypropylene filament, immediately after coming out of the spinning orifice, asymmetrically in the cross-sectional direction of the filament so as to create a cross-sectional anisotropy in the filament structure, and then stretching the filament and heat treating the same in a relaxed state. Use is made of a spinnerette in which the



minimum distance between the orifices is more than 4.0 mm. Cooling is effected by cooling gas under particular conditions of velocity and distance between spinnerette face and gas. The fiber is stretched 2.5 or more times its length at a particular temperature so that the fine voids are distributed asymmetrically in the cross section of the fiber.

3,577,499
METHOD FOR PREPARING PERMANENTLY OPAQUE FIBERS
John P. Knudsen, Raleigh, N.C., assignor to Monsanto Company, St. Louis, Mo.
Filed Sept. 5, 1967, Ser. No. 665,504
Int. Cl. D01f *7/00*
U.S. Cl. 264—182 **9 Claims**



Smooth delustered acrylic fibers having a highly porous internal microvoid structure which is permanently sealed and not collapsed by drying have been prepared by coagulation of solution spun acrylic polymers in a coagulation bath containing volatile fluorinated aliphatic compounds dissolved therein and thereafter heating the fiber.

3,577,500
PROCESS FOR THE PRODUCTION OF POLYAMIDE FIBRES HAVING HIGH LINEAR STRENGTH AND KNOT STRENGTH
Armin Kohler, Bela von Falkai, Klaus Offermann, and Alfred Reichle, Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed May 22, 1969, Ser. No. 827,018
Claims priority, application Germany, June 1, 1968, P 17 60 539.9
Int. Cl. D02j *1/22*
U.S. Cl. 264—210 **2 Claims**

Process for the production of polyamide fibres having linear strength and knot strength by stretching polyamide monofils at temperatures of 25 to 35° C. below the temperature level of the crystallite melting maximum at a ratio of 1:4.5 to 1:6.5.

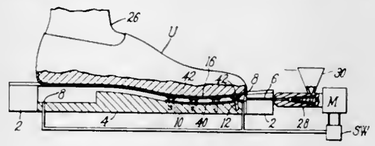
3,577,501
MOLD DOPE AND PROCESS OF USING
Monte H. York, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Continuation of application Ser. No. 752,428, July 2, 1968, which is a continuation of application Ser. No. 395,915, Sept. 11, 1964. This application Dec. 4, 1969, Ser. No. 878,965
Int. Cl. B29c *1/04;* **B29d** *27/04*
U.S. Cl. 264—213 **10 Claims**

This invention relates to a method of molding polyurethane foam materials utilizing an improved mold release agent comprising an alpha olefin having from 2 to about 4 carbon atoms and a melting point of about 100 to 250° F. in a carrier and containing .3 to about 5 parts per 100 of a substituted phenylene diamine as an antioxidant.

3,577,502
PROCESS FOR ANNEALING SUBSTANTIALLY UNSTRETCHED POLYLACTONE ARTICLES
Jan Selman and Hendricus A. Oosterhof, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.
No Drawing. Filed Feb. 9, 1968, Ser. No. 704,269
Claims priority, application Great Britain, Feb. 24, 1967, 8,861/67
Int. Cl. B29c *25/00;* **C08g** *17/02;* **D01f** *1/02*
U.S. Cl. 264—235 **10 Claims**

The extensibility, impact properties, hardness, softening temperature, water absorption and solvent resistance of shaped articles of substantially unstretched polylactones (polypivalolactone) are significantly improved by thermal after-treatment, i.e., by annealing without deformation at a temperature between about 140° and 230° C.

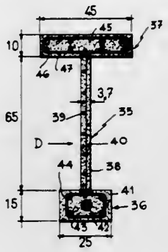
3,577,503
PROCESS OF MAKING ATHLETIC SHOES WITH INJECTION MOLDED SOLE
Thomas J. Innocenti, Beverly, Mass., assignor to USM Corporation, Flemington, N.J.
Original application Nov. 13, 1967, Ser. No. 681,997. Divided and this application Dec. 5, 1968, Ser. No. 781,346
Int. Cl. A43d *65/02;* **B29h** *7/08*
U.S. Cl. 264—244 **1 Claim**



Method for making an athletic shoe with an injection molded sole having means for receiving spikes or other projections to be attached to the sole, said means being embedded in the sole.

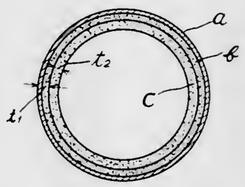
3,577,504
METHOD OF MANUFACTURING A GIRDER WITH A WEB OF REINFORCED AND/OR PRESTRESSED CONCRETE
Abraham Icchok Lipski, 85 Avenue de Boetendael, Brussels, Belgium
Continuation-in-part of application Ser. No. 533,697, Mar. 11, 1966. This application Feb. 28, 1969, Ser. No. 803,217
Claims priority, application Belgium, Mar. 26, 1965, 661,699; Dec. 8, 1965, 673,451
Int. Cl. B28b *1/02;* **F04b** *1/02, 1/08*
U.S. Cl. 264—255 **5 Claims**

A method for manufacturing a girder with a thin web in reinforced or prestressed concrete, the web thickness being 2 cm. plus 6% of the width up to 50 cm. width and 5 cm. plus 2.5% of the width thereafter. Said thin web is prefabricated independently of at least one flange



in a horizontal flat mould. Said flanges are thereafter integrated with said thin web.

3,577,505
CENTRIFUGAL MOLDING PROCESS FOR MANUFACTURING HUME-TYPE CONCRETE PIPES
Koreyoshi Ichihara, Kawasaki, Japan, assignor to Nippon Hume Pipe Co., Ltd.
Continuation-in-part of application Ser. No. 492,516, Oct. 4, 1965. This application July 17, 1969, Ser. No. 842,574
Claims priority, application Japan, Feb. 8, 1965, 40/6,879
Int. Cl. B28b *1/16, 1/20*
U.S. Cl. 264—256 **6 Claims**

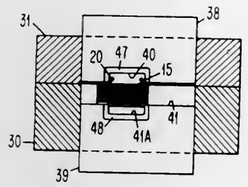


A method of manufacturing Hume-type concrete pipes by centrifugal molding. A predetermined quantity of cement slurry is introduced into a rotating pipe mold to form a layer of one density and rigidity and subsequently, a predetermined quantity of cement slurry having another density and rigidity is introduced to form another layer. One of the slurries is a hard kneaded slurry having a water content of less than saturation and of less than that required for molding. Another of the slurries is a soft kneaded slurry having a water content greater than saturation and of more than required for molding. The pipe mold is rotated such that centrifugal force commingles the surplus water from the one layer into the other layer to form a single layer having a uniform thickness and having a water content having substantially no surplus. The force created is insufficient to provide a separation of water from the slurry during molding. A single layer water content ratio of 30 to 35% water to cement is achieved.

3,577,506
FABRICATION OF ULTRA-THIN WALL BOBBINS
Augustus B. Brown, Longmont, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 4, 1969, Ser. No. 804,173
Int. Cl. B29d *3/00*
U.S. Cl. 264—272 **3 Claims**

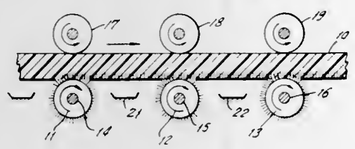
A short length of sheet-like B-stage polyesters supported by a nylon substrate is partially wrapped around a center

portion of a laminated pole piece for a magnetic read-or-record head, preferably with the B-stage polyester contacting the pole piece. The assemblage is placed in a heated compression mold. The mold is closed to form an annular space about the center portion of the pole piece and



causes the polyester and nylon to flow about the pole piece to fill the space, thereby forming a unitary annular bobbin with a wall thickness selected in the range from about 1 mil to 15 mils. After the polyester/nylon conglomerate has cured, the pole piece with the bobbin is removed from the mold.

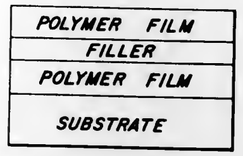
3,577,507
TUFTING PROCESS FOR FOAMED PLASTIC STRUCTURES
Herbert O. Corbett, Bridgeport, Conn., assignor to National Distillers and Chemical Corporation, New York, N.Y.
Filed Jan. 3, 1967, Ser. No. 606,802
Int. Cl. B26d *3/00*
U.S. Cl. 264—321 **3 Claims**



A tufted product such as a blanket or rug or other material having a rug or blanket like structure is formed by shredding the outer surface of an elongated foamed plastic sheet. In the shredding process, the foamed plastic sheet is carried over rolls having wire bristles extending from their surface which stab into the surface of the foamed sheet and shred the surface to produce the effect of a tufted or napped surface. Both sides of the foamed sheet are tufted by threading the sheet above and below sequentially arranged wire bristle rollers.

3,577,508
COATING AND LAMINATING PROCESS
Charles W. Desaulniers, Franklin, Mass., assignor to W. R. Grace & Co., New York, N.Y.
Original application Oct. 17, 1966, Ser. No. 587,194, now Patent No. 3,499,820, dated Mar. 10, 1970. Divided and this application July 15, 1969, Ser. No. 869,414
Int. Cl. B32b *19/02;* **B44d** *1/14*
U.S. Cl. 264—331 **10 Claims**

A process for preparing a self-supporting laminate having a low permeability to gases, comprising applying a coating of a film-forming polymer-diluent system to a substrate; adjusting the thickness of the coating; drying the coating to a solid state; applying a coating of a dispersion of a mineral, inorganic, or organic filler having a platelike structure to the resulting film; adjusting the thickness of the coating of filler; applying at least one coating or the film-forming polymer-diluent system to the

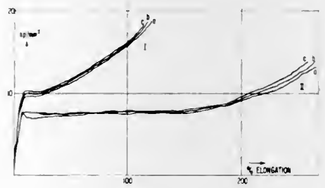


dried coating of filler; adjusting the thickness of the coating of film-forming diluent system; and drying the coating of film-forming diluent system.

3,577,509
PREVENTION OF SLUMPING IN THE MANUFACTURE OF A TAR BONDED REFRACTORY
Max Hicguet, Boulogne, Hauts-de-Seine, France, assignor to Societe d'Etudes et de Recherches Scientifiques et Minieres, Paris, France
No Drawing. Continuation of application Ser. No. 577,136, Sept. 6, 1966. This application July 25, 1967, Ser. No. 655,963
Claims priority, application France, Sept. 8, 1965, 30,765
Int. Cl. C04b *41/30*
U.S. Cl. 264—336 **13 Claims**

To prevent pressed hot tar bonded brick from slumping while cooling to a temperature below the softening point of the tar binder the ejected brick are placed on pallets that support at least two of the vertical faces of the brick. The mold box on the brick press is maintained at a controlled temperature to harden the pressed brick to a sufficient depth to allow them to be handled from the press onto the pallets. This technique is used in processes that use low softening point tar binders, e.g., a tar having a softening point in the range of 39–80° C.

3,577,510
PROCESS FOR THE PRODUCTION OF DEEP-DRAWABLE, STERILIZABLE POLYESTER FILM
Peter Josef Schmitz, Eberhard Werner, and Walter Seifried, Wiesbaden-Biebrich, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany
Filed Oct. 10, 1967, Ser. No. 674,244
Claims priority, application Germany, Oct. 13, 1966, K 60,455
Int. Cl. B29c *25/00*
U.S. Cl. 264—342 **2 Claims**



This invention relates to a process for the production of deep-drawable, sterilizable polyester film having a good shelf life in which stress is applied to an amorphous polyester film in orthogonal directions in the plane of the

film, whereby the film is thinned to at most 1/9 of the original film thickness, and the film is then at most doubled in thickness due to retardation at temperatures between 120° and 140° C.

3,577,511
PROCESS AND COMPOSITIONS FOR DIFFERENTIAL DIAGNOSIS OF THE MEGALOBLASTIC ANEMIA SYNDROMES
Adrian Leonard Luhby, 2794 Webb Ave., New York, N.Y. 10468
No Drawing. Filed Feb. 21, 1968, Ser. No. 707,303
Int. Cl. G01n *33/16*
U.S. Cl. 424—9 **22 Claims**

A method and several compositions for the accurate and early differential diagnosis of the deficiency states causing macrocytic megaloblastic anemia syndrome is provided in which one of several combinations of specified amino acids or other specific precursor compounds are administered to the test subject in metabolic loading doses and the urinary excretion of certain unusual metabolic products is determined. The metabolic anomaly in folic acid deficiency states is formiminoglutamic acid (FIGLU); in cobalamin vitamin B_{12} deficiency states it is methylmalonate (MMa). This diagnostic procedure described herein is positive even before the characteristic anemia is developed. The results of the diagnostic procedure described permits from the analysis of one urine specimen the accurate and definitive identification of the presence and severity of a folic acid and/or vitamin B_{12} deficiency state and thus affords a basis for determining specifically those two deficiency states. Other aspects of the invention are described in the specification.

3,577,512
SUSTAINED RELEASE TABLETS
Thomas H. Shepherd, Hopewell, and Francis E. Gould, Princeton, N.J., assignors to National Patent Development Corporation, New York, N.Y.
Continuation-in-part of applications Ser. No. 567,856, July 26, 1966, Ser. No. 650,259, June 30, 1967, and Ser. No. 654,044, July 5, 1967. This application Oct. 11, 1968. Ser. No. 766,840
The portion of the term of the patent subsequent to Apr. 27, 1988, has been disclaimed
Int. Cl. A61j *3/06, 3/10;* **A61k** *27/12*
U.S. Cl. 424—21 **13 Claims**

Sustained release dosage forms, e.g. tablets or pills, are prepared comprising a therapeutically active material and a hydrophilic acrylate or methacrylate polymer mixed therewith and/or as a coating therefor. Preferably, the polymer is cross-linked, most preferably by employing a diester of the acrylate or methacrylate in minor amounts.

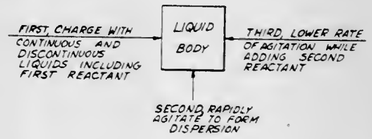
3,577,513
PELLETS FOR SUPPLYING BIOLOGICALLY ACTIVE SUBSTANCES TO RUMINANTS CONTAINING MAGNESIUM AND COATED IRON PARTICLES
Peter Roebuck and Derek James Whitehead, Swinton, Manchester, England, assignors to Pfizer Inc., New York. N.Y.
No Drawing. Filed Dec. 20, 1967, Ser. No. 691,962
Claims priority, application Great Britain, Dec. 21, 1966, 57,219/66
Int. Cl. A61j *3/00, 3/07, 3/08*
U.S. Cl. 424—22 **4 Claims**

A pellet for ruminants containing magnesium or magnesium alloy and iron particles, the latter having been treated to form an oxide or other refractory coating thereon.

3,577,514
SUSTAINED RELEASE PHARMACEUTICAL TABLETS
Ira C. Robinson, Groton, Conn., assignor to Pfizer Inc., New York, N.Y.
No Drawing. Filed June 10, 1968, Ser. No. 735,571
Int. Cl. A61k *27/12*
U.S. Cl. 424—22 **4 Claims**

A sustained release pharmaceutical tablet characterized by a substantially constant rate of drug release comprising: (a) a medicament; (b) a hydrophobic dissolution retardant; (c) an acid-insoluble release agent; and (b) a water-soluble or dispersible binder.

3,577,515
ENCAPSULATION BY INTERFACIAL POLYCONDENSATION
Jan E. Vandegaer, Wayne, N.J., assignor to Pennwalt Corporation
Continuation-in-part of abandoned application Ser. No. 525,038, Feb. 4, 1966, which is a continuation-in-part of abandoned application Ser. No. 330,255, Dec. 13, 1963. This application Mar. 4, 1968, Ser. No. 710,293
Int. Cl. A01n *17/00;* **B01j** *13/02;* **B44d** *1/02*
U.S. Cl. 424—32 **19 Claims**



Procedure for encapsulation of materials initially embodied, contained or carried in liquid is effected by interfacial polycondensation between coacting intermediates respectively in immiscible liquids, droplets of one liquid which is to be encapsulated and which contains one intermediate, being first established in a body of the other liquid. Thereafter the second intermediate is incorporated in the other liquid to produce minute capsules of the first liquid having a skin of polycondensate, e.g. polyamide, polysulfonamide, polyester, polycarbonate, polyurethane, or polyurea. Notably effective operation involves continuously supplying both the first liquid containing the first intermediate, and the second liquid, into a region where continuous agitation effects dispersion of the first liquid as droplets, the dispersion being continuously brought together with the second intermediate, thereby continuously establishing the droplet dispersion in liquid containing the second intermediate, and in consequence continuously producing encapsulated droplets by interfacial polycondensation between the intermediates.

3,577,516
PREPARATION OF SPRAY ON BANDAGE
Francis E. Gould, Princeton, and Thomas H. Shepherd, Hopewell, N.J., assignors to National Patent Development Corporation, New York, N.Y.
Continuation-in-part of applications Ser. No. 567,856, July 26, 1966, now Patent No. 3,520,949, Ser. No. 650,259, June 30, 1967, and Ser. No. 654,044, July 5, 1967. This application Dec. 2, 1969, Ser. No. 881,376
Int. Cl. A61l *15/00*
U.S. Cl. 424—46 **17 Claims**

A bandage is formed in situ on a wound by spraying on separately or simultaneously a hydrophilic water insoluble polymer and a high boiling plasticizer or solvent

therefor. Preferably the polymer is a hydroxy lower alkyl acrylate or methacrylate. Medically active ingredients can be included in the composition.

3,577,517

ACRYLIC OR METHACRYLIC ACID COPOLYMER IN RESINOUS AEROSOL HAIR PREPARATIONS

Ikuo Kubot, Sakai-shi, and Masakatsu Mikami and Selkichi Kitamura, Kyoto, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, and Goo Chemical Industry Co., Ltd., Kyoto, Japan

No Drawing. Filed Mar. 21, 1966, Ser. No. 535,675
Claims priority, application Japan, Mar. 26, 1965, 40/17,174
Int. Cl. A61k *7/06*

U.S. Cl. 424—47 **6 Claims**

A composition suitable for use as an aerosol hair lacquer comprises 30–70% of an organic solution containing 1–10 weight percent of a copolymer of (1) 5–40 weight percent of an ester of an aliphatic alcohol with acrylic or methacrylic acid; (2) 6–35 weight percent acrylic or methacrylic acid; and (3) 25–89 weight percent of some other vinyl monomer neutralized with a water soluble base and 70–30% of a spraying agent.

3,577,518

HYDROPHILIC HAIRSPRAY AND HAIR SETTING PREPARATIONS

Thomas H. Shepherd, Hopewell, and Francis E. Gould, Princeton, N.J., assignors to National Patent Development Corporation, New York, N.Y.

No Drawing. Continuation-in-part of applications Ser. No. 567,856, July 26, 1966, now Patent No. 3,520,949, Ser. No. 650,259, June 30, 1967, Ser. No. 654,044, July 5, 1967, and Ser. No. 743,626, July 10, 1968. This application July 18, 1969, Ser. No. 843,245
Int. Cl. A61k *7/10*

U.S. Cl. 424—47 **27 Claims**

Hair spray and hair setting compositions are prepared from hydrophilic copolymers of hydroxyalkyl acrylates or methacrylates with mere hydrophobic alkyl acrylates or methacrylates or alkoxyalkyl acrylates or methacrylates. There can also be included polymerizable amino compounds or olefinic carboxylic acids.

Terpolymers of alkoxyalkyl acrylates or methacrylate with alkyl acrylates or methacrylates with olefinic carboxylic acids or unsaturated amines can also be used as can tetrapolymers of the monomers set forth.

3,577,519

PROCESS FOR CONTROLLING THE AMOUNT OF DENSIFICATION IN POLYURETHANE FOAMS AND PRODUCTS PRODUCED THEREBY

Mario A. Gambardella, Milford, Conn., assignor to Olin Mathieson Chemical Corporation

No Drawing. Continuation-in-part of abandoned applications Ser. No. 658,314, Aug. 4, 1967, and Ser. No. 715,116, Feb. 27, 1968. This application Nov. 29, 1968, Ser. No. 780,246
Int. Cl. C08g *22/44;* **B29d** *27/00*

U.S. Cl. 264—54 **8 Claims**

The exterior, less dense layers in a selected, flexible densified polyurethane foam prepared by applying a compressive force to a partially cured cellular material at a critical time to reduce its volume by a specified amount are reduced by maintaining the compressive force for between about 0.1 and about 10 minutes. If desired, the compressive means can be heated to a temperature between about 40° and about 200° C. The resulting foams are particularly useful for such applications as rug padding.

3,577,520

DENTIFRICE COMPOSITIONS CONTAINING 5,5-DIARYL - 2,4 - IMIDAZOLIDINEDIONES AND PROCESS OF TREATING PYORRHEA

Emile Constantin Savini, 44 Rue du Magasin a Poudre, 14 Caen, France, and Robert Poitevin, 6 Rue Anatole de la Forge, 75 Paris 17, France

No Drawing. Continuation-in-part of application Ser. No. 669,271, Sept. 20, 1967. This application Dec. 19, 1969, Ser. No. 886,754
Int. Cl. A61k *7/16*

U.S. Cl. 424—54 **8 Claims**

This invention relates to dentifrice compositions for treatment of dental alveolus pyorrhea containing a safe but effective amount of 5,5-diaryl-2,4-imidazolidinediones and to the method of treatment of dental alveolus pyorrhea which comprises topically applying to the effected area of the gums a dentifrice composition containing a safe but effective amount of 5,5-diaryl-2,4-imidazolidinediones.

3,577,521

STORAGE-STABLE FROTHING TOOTHPASTE

Karlheinz Scheller, Eislingen (Fils), Else Koddermann, Ebersbach (Fils), and Hans Trebs, Eislingen (Fils), Germany, assignors to Firma Dr. Scheller Duro Dont, Eislingen (Fils), Germany

No Drawing. Filed July 14, 1967, Ser. No. 653,315
Claims priority, application Germany, July 29, 1966, D 50,712
Int. Cl. A61k *7/16*

U.S. Cl. 424—55 **4 Claims**

A storage-stable toothpaste that froths in use; comprising a colloidal silica thickened alcohol system that contains a limited amount of water, peroxide as a gas producing agent and an acid salt as an acidifying agent. When mixed with water and/or saliva the peroxide reacts causing the paste to foam and the pH of the mixture shifts from acidic to basic within a few minutes.

3,577,522

METHODS FOR THE TREATMENT OF SHOCK WITH ETHYLENE OXIDE-POLYPROPYLENE GLYCOL CONDENSATES AS BLOOD PLASMA SUBSTITUTES

Alan C. Hymes, Hopkins, Minn., assignor to Wyandotte Chemicals Corporation, Wyandotte, Mich.

No Drawing. Continuation-in-part of application Ser. No. 762,633, Sept. 25, 1968, which is a continuation-in-part of application Ser. No. 670,408, Sept. 25, 1967. This application Oct. 10, 1969, Ser. No. 865,521
Int. Cl. A61k *27/00*

U.S. Cl. 424—78 **5 Claims**

Isotonic solutions of certain ethylene oxide-polypropylene glycol condensation products have been found to be extremely effective as blood plasma substitutes in the treatment of shock.

3,577,523

WATER-INSOLUBLE ANTIGENIC SUBSTANCES AND METHOD OF PREPARING THE SAME AND ANTIGENIC DEPOT AGENTS INCORPORATING SUCH SUBSTANCES

Morris Emmanuel Stolar, Trumbull, Conn., and Joseph George Feinberg, London, England, assignors to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Mar. 7, 1969, Ser. No. 805,378
Int. Cl. A61k *23/00;* **C12k** *5/00*

U.S. Cl. 424—88 **8 Claims**

Water-insoluble antigenic substances prepared by combining a liquid extract or suspension of an antigenic material with an insolubilizing agent such as a preformed aluminum tannate or in situ formed aluminum tannate, and antigenic depot agents incorporating these water-insoluble antigenic substances useful for stimulating prolonged antibody response.

3,577,524

DIMETHYLPOLYSILOXANE SUSPENSIONS OF BIOLOGICS AND PREPARATION THEREOF

Walter David Pratt, Spring Valley, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Mar. 4, 1968, Ser. No. 709,940
Int. Cl. C12k *5/00*

U.S. Cl. 424—89 **8 Claims**

A stable suspension of a biological in dimethylpolysiloxane is provided containing one or more polyhydric alcohols. Exemplary of such stable suspensions is a suspension containing smallpox vaccine, dimethyl polysiloxane, 4 to 10% by weight mannitol, and 4 to 10% by weight sorbitol. The biological suspensions maintain their efficacy, potency, and suspension characteristics under prolonged storage and can be directly withdrawn from their containers and administered to the patient.

3,577,525

ADENOVIRUS VACCINE AGAINST CANINE HEPATITIS

James A. Baker, Ithaca, N.Y., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

No Drawing. Original application July 1, 1964, Ser. No. 379,744, now Patent No. 3,346,456, dated Oct. 10, 1967. Divided and this application Aug. 15, 1967, Ser. No. 660,616
Int. Cl. C12k *71/00*

U.S. Cl. 424—89 **1 Claim**

A method of protecting a dog against infectious canine hepatitis by inoculation of the dog with live adenovirus alien to the dog.

3,577,526

STABILIZED SMALLPOX VACCINE

Louis R. Valette, Marcy L'Etoile, Rhone, France, assignor to Societe Anonyme dite: Institut Merieux, Lyon, Rhone, France

No Drawing. Filed June 13, 1969, Ser. No. 833,170
Int. Cl. A61k *27/10;* **C12k** *5/00*

U.S. Cl. 424—89 **5 Claims**

Smallpox vaccine is stabilized by dispersing the same in an aqueous solution containing sucrose. The solution can also contain dextran.

3,577,527

***NEISSERIA MENINGITIDIS* ANTIGEN**

Earl A. Edwards, Lake Bluff, Ill., assignor to the United States of America as represented by the Secretary of the Navy

No Drawing. Filed Jan. 27, 1969, Ser. No. 794,341
Int. Cl. A61k *27/00*

U.S. Cl. 424—92 **8 Claims**

An antigen of *N. meningitidis* which has a high degree of sensitivity and specificity for determining the presence of antibodies in blood is provided by a method in which *N. meningitidis* is subjected to a mild alkaline hydrolysis with production of a lipopolysaccharide antigen.

3,577,528

TWO PHASE HAIR CONDITIONER COMPOSITIONS

Everett G. McDonough, Yonkers, and Walter W. Edman, Port Washington, N.Y., assignors to Zotos International, Inc., Darien, Conn.

No Drawing. Filed May 27, 1966, Ser. No. 553,278
Int. Cl. A61k *7/06*

U.S. Cl. 424—70 **5 Claims**

A two phase hair conditioner having an aqueous and a water immiscible phase which evaporate at the same rate, which imparts along the hair shaft various hair treatment agents.

3,577,529

COMPOSITIONS AND METHODS FOR ENHANCEMENT OF THE GROWTH RATE OF POULTRY AND ANIMALS EMPLOYING ALKALI METAL FORMALDEHYDE SULFOXYLATES AND BISULFITES

Joseph Michael Pensack, Hopewell Township, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Apr. 17, 1968, Ser. No. 721,921
Int. Cl. A61k *21/00*

U.S. Cl. 424—114 **11 Claims**

A growth rate accelerator for poultry and farm animals having as one active component, an alkali metal formaldehyde bisulfite or an alkali metal formaldehyde sulfoxylate. The compositions can, in addition, contain other materials which enhance the growth rate of the host, such as tetracycline antibiotics, penicillins, zinc bacitracin, erythromycin and/or bis(5-nitrofurfurylidene)-acetone-guanylhydrazone. Growth rate accelerating compositions comprising the above-mentioned growth rate accelerators and ingestible diluents are also provided.

3,577,530

JANIEMYCIN

Edward Meyers, East Brunswick, William Lawrence Parker, Brunswick, Frank Lee Weisenborn, Somerset, Felix Edward Pansy, Jamesburg, and Pacifico Anthony Principe, South River, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed July 24, 1969, Ser. No. 844,342
Int. Cl. A61k *21/00*

U.S. Cl. 424—118 **7 Claims**

The antibiotic janiemycin is obtained by the cultivation under controlled conditions, of *Streptomyces macrosporeus* ATCC 21388. Janiemycin is active against bacteria.

3,577,531

DIANEMYCIN FOR TREATING COCCIDIOSIS

Marvin Gorman and Robert L. Hamill, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Filed Sept. 11, 1968, Ser. No. 759,198
Int. Cl. A61k *21/00*

U.S. Cl. 424—122 **1 Claim**

Methods and compositions for controlling coccidiosis employing the antibiotic dianemycin and its alkali metal, alkaline earth, and basic nitrogen salts as the active anticoccidiosis agent.

3,577,532

DISINFECTED ANTACID COMPOSITIONS AND METHOD FOR THE PREPARATION THEREOF

George H. Schneller, Devon, and Ralph S. Levi, Norristown, Pa., assignors to American Home Products Corporation, New York, N.Y.

No Drawing. Filed June 30, 1967, Ser. No. 650,243
Int. Cl. A61k *27/00;* **A61l** *13/00*

U.S. Cl. 424—149 **6 Claims**

Pharmaceutical or cosmetic compositions especially susceptible to microbiological contamination, are disinfected by treatment with chloramines.

3,577,533

ANTACID COMPOSITIONS CONTAINING BISMUTH ALUMINATE AND COPRECIPITATED ALUMINUM HYDROXIDE AND MAGNESIUM CARBONATE

Joseph Alfred Rider, Mill Valley, Calif. (255 Hugo St., San Francisco, Calif. 94122)

No Drawing. Continuation-in-part of abandoned application Ser. No. 500,268, Oct. 21, 1965. This application Feb. 21, 1968, Ser. No. 707,278
Int. Cl. A61k *27/00*

U.S. Cl. 424—155 **3 Claims**

The antacid compositions are novel pharmaceutical compositions containing bismuth aluminate and a copre-

cipitate of aluminum hydroxide and magnesium carbonate which are useful in the treatent of gastric disorders such as ulcer of the stomach or duodenum, gastritis, hiatal hernia, duodenitis and marginal ulcer.

3,577,534
STABLE ORALLY ACTIVE HEPARINOID COMPLEXES
Teow Yan Koh and Kekhusroo Rustomji Bharucha, Toronto, Ontario, Canada, assignors to Canada Packers Limited, Toronto, Ontario, Canada
No Drawing. Continuation-in-part of application Ser. No. 650,621, July 3, 1967. This application Feb. 14, 1969, Ser. No. 799,521
Claims priority, application Canada, June 20, 1968, 22,996/68
Int. Cl. A61k *17/18*
U.S. Cl. 424—183 **29 Claims**

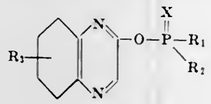
This invention relates to new stable heparinoid complexes which are absorbable through the mucous membranes of the mammalian body, prepared by reacting heparinic acid or other acid heparinoids with non-toxic organic compounds having weakly basic or amphoteric properties and characterized by a base strength pK_b in the range of from about 7.0 to 12.5 or by an isoelectric point pI below about 9.7, to methods for preparing and using these new heparinoid complexes, and to therapeutic compositions containing them. Particularly suitable heparinoid complexes are those prepared from heparinic acid and amino acids having an isoelectric point pI below about 9.7.

3,577,535
TREATMENT OF THYROID HORMONE IMPAIRMENT PHARMACEUTICAL COMPOSITIONS CONTAINING 3,5,3′ - L-TRIIODOTHYRONINE COMPLEXES
Harold C. Reynolds, Kankakee, and Donald B. Olsen, Bonfield, Ill., assignors to Armour Pharmaceutical Company, Chicago, Ill.
No Drawing. Original application June 29, 1966, Ser. No. 561,357, now Patent No. 3,477,954. Divided and this application Jan. 27, 1969, Ser. No. 794,408
Int. Cl. A61k *27/00*
U.S. Cl. 424—198 **3 Claims**

A pharmaceutical composition consisting of a pharmaceutically acceptable carrier and the reaction product formed by reacting less than a stoichiometric amount of a tertiary phosphine with thyroxine (free acid) in a dipolar aprotic solvent. The composition contains thyroxine (free acid) and 3,5,3′-L-triiodothyronine in a preselected ratio to each other and is useful for the treatment and control of body disorders associated with an impairment of the thyroid hormone function.

3,577,536
METHOD OF CONTROLLING INSECTS AND ARACHNIDS WITH TETRAHYDROQUINOXALINYL PHOSPHATES OR THIOPHOSPHATES
Bernard Miller, Amherst, Mass., and Tamara Helen Mladineo Gund, Mercer, N.J., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Original application Aug. 7, 1967, Ser. No. 658,637, now Patent No. 3,505,327, dated Apr. 7, 1970. Divided and this application Mar. 31, 1970, Ser. No. 24,381
Int. Cl. A01n *9/36*
U.S. Cl. 424—200 **10 Claims**

A method of protecting crops and controlling insects or arachnids by applying a compound having the formula:



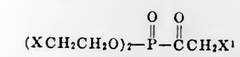
wherein X is a member selected from the group consisting of sulfur and oxygen; R_1 and R_2 are each lower alkyl, lower alkoxy, lower thioalkyl, phenyl, halophenyl, benzyl or $—NR_4R_5$; R_3 is hydrogen or lower alkyl; and R_4 and R_5 are each selected from the group consisting of hydrogen and lower alkyl.

3,577,537
TOPICAL ADMINISTRATION OF VITAMIN B–12
Eugene E. Howe, Somerset, and Charles Rosenblum, Princeton, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Continuation-in-part of application Ser. No. 629,918, Apr. 11, 1967. This application Mar. 9, 1970, Ser. No. 17,897
Int. Cl. A61k *25/02*
U.S. Cl. 424—201 **4 Claims**

Vitamin B–12 is administered to animals by topical application in a non-toxic solvent.

3,577,538
HALOGENATED PHOSPHONATES USED FOR CHEMOSTERILIZING SCREW-WORM FLIES
Philip C. Hamm, Glendale, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Oct. 23, 1967, Ser. No. 677,076
Int. Cl. A01n *9/36*
U.S. Cl. 424—214 **4 Claims**

Compounds of the following formula are insect chemosterilants:



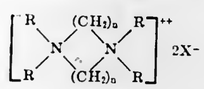
wherein X and X^1 are halogen (Cl, Br, F and I).

3,577,539
SYNERGISTIC ANTIBACTERIAL COMPOSITION
Leonard J. Vinson, Glen Rock, N.J., assignor to Lever Brothers Company, New York, N.Y.
No Drawing. Continuation of application Ser. No. 800,732, Feb. 19, 1969, which is a continuation-in-part of application Ser. No. 642,327, May 31, 1967, which in turn is a continuation-in-part of application Ser. No. 444,411, Mar. 31, 1965. This application Jan. 19, 1970, Ser. No. 4,471
Int. Cl. A61k *27/00*
U.S. Cl. 424—231 **2 Claims**

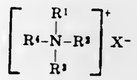
The specification discloses germicidal compositions containing phenolic germicides, such as p-tert-amylphenol, o-phenylphenol, o-benzyl-p-chlorophenol, and polybromosalicylanilide, such as 3,4′,5-tribromosalicylanilide and 4′,5-dibromosalicylanilide.

3,577,540
METHOD OF PROMOTING OSTEOGENESIS
Dirck V. Myers, Atlanta, Ga., assignor to E. R. Squibb & Sons, Inc., New York, N.Y.
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,162
Int. Cl. A61k *27/00*
U.S. Cl. 424—244 **8 Claims**

A method of promoting osteogenesis in animal hosts which comprises applying to the area of a bone defect a quaternary ammonium compound of the formula



wherein R represents lower alkyl, X represents chlorine or bromine, and *n* is an integer from six to twelve; or of the formula



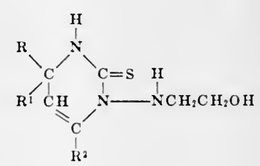
wherein R^4 represents an alkyl group containing twelve to twenty carbon atoms; R^1, R^2 and R^3 each represent lower alkyl, and R^1, R^2 and R^3 taken together with the nitrogen atom represent pyridinium; and X represents chlorine or bromine.

3,577,541
COMPOSITIONS AND METHODS FOR EFFECTING TRANQUILITY WITH TRIAZINES
John Thomas Shaw, Middlesex, N.J., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Continuation-in-part of application Ser. No. 240,745, Nov. 28, 1962, now Patent No. 3,505,322, dated Apr. 5, 1970. This application July 23, 1963, Ser. No. 296,915
Int. Cl. A61k *27/00*
U.S. Cl. 424—249 **5 Claims**

(N-monooxyamino)-s-triazines for effecting tranquilization.

3,577,542
INSECT CHEMOSTERILANT HYDROXYETHYLAMINO PYRIMIDINES
Philip C. Hamm, Glendale, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Oct. 23, 1967, Ser. No. 677,081
Int. Cl. A01n *9/22*
U.S. Cl. 424—251 **8 Claims**

Compounds of the following formula are insect chemosterilants:



wherein R, R^1 and R^2 are selected from the group consisting of hydrogen and alkyl of not more than 4 carbon atoms.

3,577,543
INSECTICIDAL AND FUNGICIDAL 2-AMINOPYRIMIDINYL-6-CARBAMATE COMPOSITIONS
Francis Leslie Charles Baranyovits, Ranajit Ghosh, Nigel Douglas Bishop, and Peter Frank Hilary Freeman, Bracknell, and William Glynne Moss Jones, Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Original application Mar. 10, 1967, Ser. No. 622,043, now Patent No. 3,493,574, dated Feb. 3, 1970. Divided and this application Nov. 14, 1969, Ser. No. 871,296
Claims priority, application Great Britain, Mar. 31, 1966, 14,272/66
Int. Cl. A01m *9/22*
U.S. Cl. 424—251 **6 Claims**

Pesticidal compositions containing a 2-aminopyrimidinyl-6-carbamate or salts thereof. Representatve active ingredients are 5,6-dimethyl-2-dimethylamino-4-dimethylcarbamoyloxypyrimidine and the corresponding 5-ethyl-6-methyl, 5-n-propyl-6-methyl, 5-cyanoethyl-6-methyl derivatives. These compounds may be used in the form of dusting powders or granules, dips or sprays to combat fungal and/or insect infestations in plants and animals. They may also be used in fertilizers or otherwise to treat agricultural soils.

3,577,544
METHODS FOR PRODUCING MUSCLE RELAXANT AND CNS-DEPRESSANT EFFECTS WITH 3-AMINO-4-PHENYL FURAZAN AND COMPOSITION THEREFOR
Claude Lehmann and Ernst Renk, Basel, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Filed Feb. 2, 1968, Ser. No. 702,550
Claims priority, application Switzerland, Jan. 26, 1968, 1,250/68
Int. Cl. A61k *27/00*
U.S. Cl. 424—272 **2 Claims**

Methods and compositions for producing anti-convulsive, muscle-relaxing, and CNS-depressing effects in mammals, by administration of an effective amount of 3-amino-4-phenyl-furazan.

3,577,545
N-TETRAHALOETHYLTHIO PYRAZOLES AS BACTERICIDES AND FUNGICIDES
Joseph G. E. Fenyes, Oakland, Calif., assignor to Chevron Research Company, San Francisco, Calif.
No Drawing. Original application June 5, 1967, Ser. No. 643,415, now Patent No. 3,409,632, dated Nov. 5, 1968. Divided and this application Dec. 21, 1967, Ser. No. 703,816
Int. Cl. A01n *9/22*
U.S. Cl. 424—273 **8 Claims**

N-(1,1,2,2-tetrahaloethylthio) pyrazoles in which the pyrazole nucleus is substituted in the 3 and 5 positions with hydrogen or lower alkyl groups and in the 4 position with hydrogen, halogen or a nitro group. Compounds of this class are fungicidal and bactericidal. They are made by reacting a pyrazole or its alkali metal salt with tetrahaloethylsulfenyl halides.

3,577,546
USE OF POLYCHLORO KETO-ALKENOIC ACIDS AND DERIVATIVES THEREOF AS INSECTICIDES
William A. Erby, Alburtis, and Robert A. Walde, Emmaus, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
No Drawing. Filed Apr. 8, 1966, Ser. No. 541,096
Int. Cl. A01n *9/28*
U.S. Cl. 424—279 **7 Claims**

A method for killing insects which comprises contacting the insects with an insecticidally effective amount of a polychloro keto-alkenoic acid or derivative thereof.

3,577,547
COMPOSITION PROTECTING AGAINST THE ACTION OF MICROORGANISMS AND ITS MANNER OF USE
Jean-Paul Pelissier, Vitry-sur-Seine, and Pierre Chiffert, Marseille, France, assignors to Societe Anonyme: Produits Chimiques Industriels & Agricoles Procida S.A., St. Marcel Marseille, Bouches du Rhone, France
No Drawing. Continuation-in-part of application Ser. No. 318,440, Oct. 23, 1963. This application Apr. 8, 1968, Ser. No. 719,715
Claims priority, application France, Nov. 23, 1962, 916,456
Int. Cl. A01n *9/02*
U.S. Cl. 424—286 **6 Claims**

The invention prevents damage to liquid or wet paper pulp by microorganisms and forestalls or destroys the microbic ooze that forms in the water of systems of paper mills by use of a composition comprising a mixture of (1) alkali metal or alkaline earth metal salts of di(lower alkyl) dithiocarbamic acid, chiefly alkali metal dimethyl dithiocarbamate, (2) alkali metal of (lower alkylene)-bis-dithiocarbamic acid, chiefly (ethylene) - bis - dithio-

carbamic acid, and (3) a stabilizer consisting of 1,8,3,6 diendomethylene 1,3,6,8 tetraazacyclodecane, also known as 1,3,6,8 diendomethylene 1,3,6,8 tetraazacyclodecane.

3,577,548
METHODS FOR STERILIZING INSECTS WITH TRIARYLTIN COMPOUNDS
Eugene E. Kenaga, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Continuation-in-part of application Ser. No. 244,917, Dec. 17, 1962. This application Dec. 31, 1964, Ser. No. 422,554
Int. Cl. A01n *9/22, 9/00*
U.S. Cl. 424—288 **25 Claims**

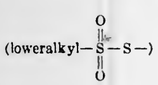
Methods for administering to an animal a minimal sterilant amount of a triaryltin compound of the group of

$$R_3—Sn—Z$$

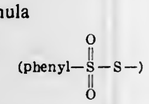
and

$$(R_3—Sn)_2Y$$

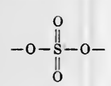
wherein, in all of its occurrences in any given triaryltin compound, R represents the same member selected from the group consisting of phenyl, mono-substituted phenyl wherein the substituent is a member selected from the group consisting of halo, loweralkyl, and loweralkoxy; Z represents a monovalent moiety selected from the group consisting of (phenylloweralkyl), alkenyl, alkadienyl, cycloalkenyl, cycloalkadienyl, halo, hydroxy, mercapto, hydrogen, alkanoate, alkenoate, loweralkoxy, loweralkylthio, diloweralkylcarbamate, diloweralkylthiocarbamate, diloweralkyldithiocarbamate, radical of the formula



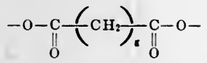
radical of the formula



and radical of the formula —Sn—R_3; and Y represents a divalent moiety selected from the group consisting of –O—, —S—, methylene, ethylene, ethynylene,



carbonyl, 1,3-butadien-1,4-ylene, and



wherein *g* is an integer of from 1 to 10, both inclusive.

3,577,549
TREATMENT OF PAIN OR INFLAMMATION WITH P-BENZOYL-PHENYLACETIC ACID OR O-BENZOYL-PHENYLACETIC ACID
David Jack and Deryck Rhodes, London, England, assignors to Allen & Hanburys Limited, London, England
No Drawing. Filed Aug. 9, 1968, Ser. No. 751,379
Claims priority, application Great Britain, Aug. 21, 1967, 38,424/67
Int. Cl. A61k *27/00*
U.S. Cl. 424—317 **2 Claims**

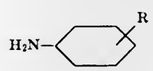
Pharmaceutical compositions comprising as active ingredient either p-benzoyl-phenylacetic acid, or o-benzoyl-phenylacetic acid, which compounds may be used in the form of physiologically acceptable salts. These active ingredients have anti-inflammatory and analgetic activity. They may be administered in dosage unit form.

3,577,550
N-(PHENOXY)PHENYL-SALICYLAMIDES AND THEIR UTILIZATION AS MOLLUSCIDIDES
Clarence L. Moyle, Clare, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed May 2, 1968, Ser. No. 726,205
Int. Cl. A01n *9/20*
U.S. Cl. 424—324 **3 Claims**

Novel N-(phenoxy)phenyl-salicylamides and their preparation by reaction between a salicylic acid, phosphorus trichloride and a phenoxyaniline. They are useful as molluscidides.

3,577,551
METHODS FOR TREATING PAIN, INFLAMMATION AND COUGH
Masuo Murakami and Kaname Kuriaki, Tokyo, Masaru Iwanami, Kanagawa, Hideki Arima, Tokyo, Kenji Sano and Hiroshi Suzuki, Saitama, and Soichi Kagami, Tokyo, Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan
No Drawing. Filed Apr. 15, 1969, Ser. No. 816,400
Claims priority, application Japan, Apr. 20, 1968, 43/26,514
Int. Cl. A61k *27/00*
U.S. Cl. 424—325 **3 Claims**

A method of alleviating pain, inflammation and/or cough which comprises administration of a compound selected from the group consisting of compounds of the formula:



wherein R may be hydrogen or lower alkyl, and their pharmaceutically acceptable acid addition salts.

3,577,552
METHOD OF INDUCING LOCAL ANESTHESIA
Bernard M. Regan, Chicago, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.
No Drawing. Continuation-in-part of application Ser. No. 741,235, June 28, 1968. This application May 8, 1970, Ser. No. 35,941
Int. Cl. A61k *27/00*
U.S. Cl. 424—326 **6 Claims**

A method of inducing local anesthesia by administering to animals a benzoxyalkyl substituted thiopseudourea, for example, 2-(2 - benzoxyethyl) - 2 - thiopseudouronium chloride.

3,577,553
COMPOSITIONS AND METHODS FOR CONTROLLING COCCIDIOSIS IN POULTRY EMPLOYING TRIAZOLE DERIVATIVES
Robert J. Ferlauto, Perkasie, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.
No Drawing. Filed Jan. 29, 1969, Ser. No. 795,043
Int. Cl. A61k *27/00*
U.S. Cl. 424—269 **10 Claims**

Chemotherapeutic compositions useful for the prevention and control of coccidiosis comprising adducts between a benzaldehyde or a cinnamaldehyde and an aminotriazole or between an alkyl aryl ketone and an aminotriazole, optionally substituted in the aromatic ring, are described as specific and novel compounds useful for the prevention and control of coccidiosis.

3,577,554
SELF-CURING LATEX FOAM COMPOSITIONS
Donald B. Parrish, Lake Jackson, and James M. McDuff, Angleton, Tex., asssignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed May 24, 1967, Ser. No. 640,791
Int. Cl. C08f *47/10;* **C08j** *1/16*
U.S. Cl. 260—2.5 **13 Claims**

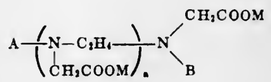
A film-forming latex of a copolymer of an α,β-ethylenically unsaturated carboxylic acid, such as an acrylic acid, and a copolymerizable ethylenically unsaturated monomer is reacted with an aziridine at a pH below about 5 to form a copolymer having aminoester groups and carboxyl groups and the pH then is adjusted to above 7. The resulting stable latex, optionally containing formulating ingredients, is frothed, dried and cured to obtain a latex foam. Often the frothed composition is applied in the wet state to an adherent substrate, e.g., to a textile, then cured and dried to form an article such as a drapery.

3,577,555
CARBON BLACK IN PAPER COATING LATEX
Robert A. Forrester and Ralph E. McNay, Houston, Tex., assignors to Ashland Oil, Inc., Houston, Tex.
No Drawing. Filed June 22, 1966, Ser. No. 559,423
Int. Cl. C08d *7/00*
U.S. Cl. 260—17.4 **8 Claims**

Stable aqueous slurries of carbon black and latexes of polymers of ethylenically unsaturated monomers, especially diene polymers, are prepared by adding a dispersing agent prepared by mixing a water soluble natural gum with an anionic surface active agent to the polymer latex, and then adding dry carbon black. The amount of dispersing agent is selected to be sufficient to stabilize the latex against the destabilizing effect of the carbon black. Stable latex slurries can be prepared at 30–60% latex polymer and an amount of carbon black equal to or greater than the latex polymer content.

3,577,556
POLYAMINES STABILIZED WITH AMINO-CARBOXYLATE CHELANTS
Juan Longoria III, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Jan. 5, 1968, Ser. No. 695,835
Int. Cl. C07c *87/14, 119/00;* **C08g** *51/60*
U.S. Cl. 260—45.85 **9 Claims**

Aminocarboxylate chelants of the formula;



where A and B are independently —C_2H_4OH or

—CH_2COOM

a is 0–2, and M is a monovalent cation are effective stabilizers for polyamines including alkylenepolyamines, polyalkylenepolyamines and polyalkylenimines. Addition of about 0.05–10.0 weight percent of the chelant reduces the acid catalyzed and oxidative degradation and discoloration of these polyamines.

3,577,557
BENZO[1,5]DIAZOCINONES
Hans Ott, Convent Station, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Filed Dec. 9, 1966, Ser. No. 600,403
Int. Cl. C07d *53/00, 51/48*
U.S. Cl. 260—239.3 **20 Claims**

The invention discloses compounds of the class of 6-phenyl-3,4-dihydro[1,5]benzodiazocin-2-(1H)-ones useful as tranquilizers. Also disclosed is preparation of said compounds featuring intermediates which are 1,5-methano-1,5-benzodiazocin-2-ones which are converted by acid treatment to the corresponding 6-phenyl-3,4,5,6-tetrahydro[1,5]benzodiazocin-2-(1H)-ones which in turn may be oxidized to obtain the first-mentioned class of compounds.

3,577,558
1-AMINOALKYLAMINO-4-ALKOXYMETHYL-THIOXANTHENE DERIVATIVES
David Rosi, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.
No Drawing. Filed Apr. 15, 1968, Ser. No. 721,190
Int. Cl. C07d *65/16, 7/42;* **A61k** *27/00*
U.S. Cl. 260—328 **5 Claims**

1-aminoalkylamino - 4 - (lower-alkoxymethyl)thioxanthenes, -thioxanthene-S-oxides or -dioxide, -xanthenes and -9-one derivatives thereof, having schistosomicidal activity, are prepared by reacting the corresponding 4-hydroxymethyl compounds with a lower-alkanol in an acidic medium, e.g., in the presence of a strong acid, e.g., p-toluenesulfonic acid.

3,577,559
PROCESS FOR MAKING GLYCOL ETHERS AND GLYCOL ESTERS
Lee H. Horsley, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Jan. 19, 1968, Ser. No. 699,055
Int. Cl. C07c *69/76*
U.S. Cl. 260—410.6 **11 Claims**

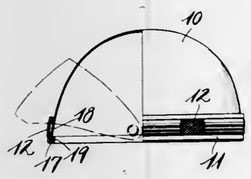
Glycol ethers or glycol esters having the formula $ROC_mH_{2m}ZC_nH_{2n}OH$ are prepared by reacting a compound having the formula ROH, a cyclic compound having the formula $C_mH_{2m}Z$ and having at least three and not more than five carbon atoms in the ring and a vicinal alkylene oxide having the formula $C_nH_{2n}O$ where the molar ratio of $C_mH_{2m}Z$ to vicinal oxide is between one to ten and ten to one, the molar ratio of vicinal oxide plus $C_mH_{2m}Z$ to ROH is at least one to one, R is acyl having at least two and not more than eighteen carbon atoms or aryl having up to two aromatic rings, Z is oxygen or sulfur, *m* is an integer of from three to fifteen inclusive and *n* is an integer of from two to four inclusive. They are useful as solvents, lubricants, hydraulic fluids and chemical intermediates.

3,577,560
METHOD OF FORMING PELLETS OF A FLUX COMPOSITION
Garth D. Lawrence, Midland, and Jack J. Ott, Hemlock, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Mar. 27, 1968, Ser. No. 716,359
Int. Cl. B01j *2/02*
U.S. Cl. 264—8 **5 Claims**

The present invention comprises a method of preparing a pelleted flux product by melting a flux composition while maintaining a continuous cover of unmelted flux over the molten portion, forming the melt into molten droplets, and solidifying the droplets into discrete particles or pellets.

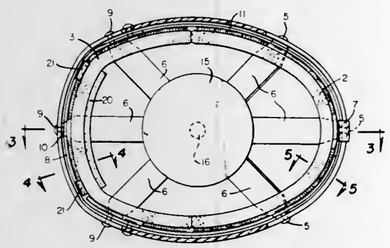
GENERAL AND MECHANICAL

3,577,561
HELMET FOR ACCIDENT PREVENTION
Ichiro Oshima, Ota-Shi, Japan (c/o Oshima Denki Seisakusho Co. Ltd., No. 42, Fujikura)
Continuation of application Ser. No. 648,393, June 23, 1967, now abandoned. This application Aug. 13, 1969, Ser. No. 850,345
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 **3 Claims**



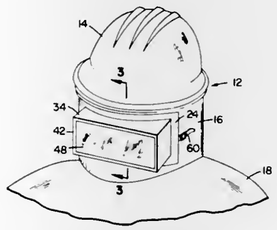
This invention is intended to provide a helmet for accident prevention comprising in combination a helmet and a plurality of reflectors, said reflectors being attached to outer portions of the helmet, each of said reflectors having a number of reflector elements and adapted to reflect an incident ray of light substantially in the direction of the light source, thereby enabling the user, such as, for example, a driver of motorcycle, to be easily found even in the dark by other person, such as, for example, a driver of car. Thus, with the helmet, accidents, particularly a night traffic accident may be prevented from occurring.

3,577,562
ATHLETES' PROTECTIVE HELMET PARTICULARLY FOOTBALL
Mike C. Holt, Leesburg, Fla. (Southern Athletic Service, Inc., P. O. Box 46, Leesburg, Fla. 32748)
Continuation-in-part of application Ser. No. 839,585, July 7, 1969. This application Oct. 1, 1969, Ser. No. 862,663
Int. Cl. A42b *3/00*
U.S. Cl. 2—3 **5 Claims**



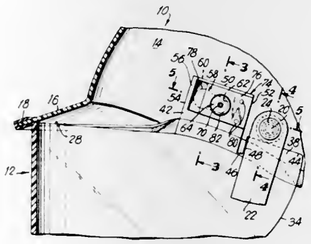
The protective helmet has a shell of hard, rigid plastic material, and radially suspended pads that entirely encircle the wearer's head. The front pad and the rear pad are each fastened to the horizontal plastic bands, which encircle the inner circumference of the shell. The pads are affixed to the respective plastic bands by mating tapes, one on the inside surface of the plastic band and the other on the outer surface of the pad, whereby when pushed together the pad is held to the plastic band. Each plastic band is held securely to the shell by spaced rivets. In the front there is one plastic band, and in the rear there are two longitudinal plastic bands, one being higher than the other, the higher band being at approximately the same level as the front plastic band. The rear pad extends slightly below the edge of the helmet to protect the neck better. Because the plastic bands are spaced from the inner surface of the shell, this affords air circulation that keeps the helmet cool—the advantage of this padded helmet over other padded helmets.

3,577,563
INSERT FOR HEAD PROTECTING HOODS
Herbert A. Raschke, Greenbrae, Calif., assignor to E. D. Bullard Company,, Sausalito, Calif.
Continuation of application Ser. No. 697,950, Jan. 15, 1968, now abandoned. This application Aug. 25, 1969, Ser. No. 853,622
Int. Cl. A61f *9/06*
U.S. Cl. 2—8 **3 Claims**



An insert for the faceplate of a protective hood, which insert is curved on one side to conform with the curvature of the faceplate and flat at another side so as to define a planar opening for receiving a flat transparent plate. Clips or a resilient frame member on the insert retain the transparent plate in place and are conveniently movable to afford quick insertion and removal of the transparent plate so that such plate can be replaced as needed.

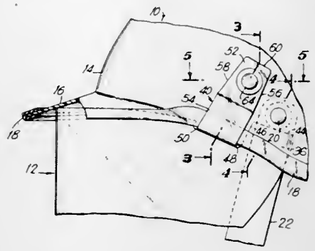
3,577,564
FACE SHIELD
Rodney S. Hill, Dover, Del., assignor to ILC Industries, Inc.,, Dover, Del.
Filed Aug. 26, 1968, Ser. No. 755,463
Int. Cl. A61f *9/04*
U.S. Cl. 2—10 **6 Claims**



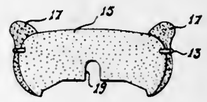
Protective face shield and mounting means therefor which enable quick and easy structural association and disassociation relative to protective headgear, such as a helmet shell, while providing positive restraint against rotation or pivoting movement of the face shield inwardly toward the face of a wearer.

3,577,565
FACE SHIELD
Frederick W. Feldmann, and Rodney S. Hill, Dover, Del., assignors to ILC Industries, Inc., Dover, Del.
Filed Aug. 26, 1968, Ser. No. 755,464
Int. Cl. A61f *9/04*
U.S. Cl. 2—10 **8 Claims**

Protective face shield and mounting means therefor which enable quick and easy structural association and disassociation relative to protective headgear, such as a helmet shell, while providing positive restraint against rotation or pivoting movement of the face shield inwardly toward the face of a wearer.

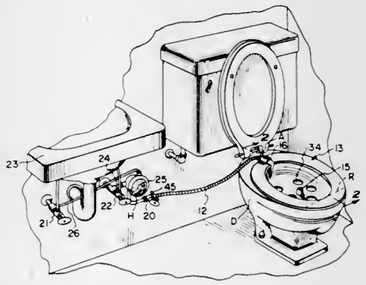


3,577,566
SPECTACLE HOOD
Benjamin Kislin, and J. W. Miller, San Antonio, Tex.
Filed Nov. 21, 1968, Ser. No. 777,791
Int. Cl. A61f *9/04;* **G02c** *7/16*
U.S. Cl. 2—12 **1 Claim**



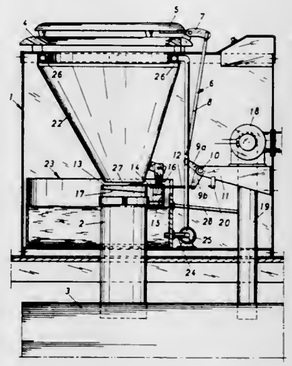
A spectacle hood having an opaque front with an appropriate cutout section conforming to the configuration of the cowl above an aircraft instrument panel. The device is held in place on the face by spectacle temples and peripheral vision is excluded by flexible sideshields. Where individual corrective lenses are required, the proper prescription can be incorporated in the clear area of the device.

3,577,567
MODIFIED MULTI-PURPOSE BIDET
Andrew F. Wintercorn, 2449 Clinton Road, Rockford, Ill.
Filed Oct. 14, 1968, Ser. No. 767,227
Int. Cl. A47k *3/22*
U.S. Cl. 4—7 **15 Claims**



The device in both forms may be used with an adapter attached to the mixing faucet on a lavatory or bathtub, or may be connected permanently or semipermanently with a mixing valve that has connections with the hot and cold water valves under a lavatory. In either event, the basin has its flange resting on the toilet bowl for support and is provided with a substantially central upwardly directed spray nozzle to which water of the desired temperature is delivered normally when a spring closed valve on the rear flange is automatically opened by the operator sitting on the basin, the flow being controllable by the user leaning forward, more or less, to relieve pressure on the rear portion, which is an especially important feature when a douche or enema nozzle is being used in lieu of the ordinary bidet nozzle. Jet sprays around the rim of the basin to which water is delivered continuously independently of the automatic valve, serve for rinsing purposes and also for temperature testing, while the flow to these jets warms up the rim of the basin for better comfort prior to the operator sitting on the basin. In the combination bidet and sitzbath the basin is somewhat deeper, and, in addition to the holes provided in the bottom around the nozzle for drainage, there are overflow holes provided in the sidewalls of the basin near the top in circumferentially spaced relation between the jet openings, and one may, by shutting off flow through the bottom drain holes, trap sufficient water in the basin for sitzbath operation. Medication may be added by passing the incoming warm water through a container for the medication, that is transparent so that one can tell immediately when the medication is used up.

3,577,568
WATER CLOSET
Ole Bjerke Johansen, Asmundtorp 147, S-430 61, Harryda, and Jan Ove Hertil Herveus, Nygardsvagen 18 D, S-433 00, Partille, Sweden
Filed Oct. 10, 1969, Ser. No. 865,538
Int. Cl. E03d *5/016*
U.S. Cl. 4—77 **4 Claims**

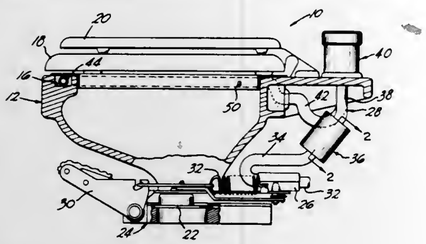


A water closet using a very limited amount of flushing water owing to recirculation of the same by means of a pump system. The flushing liquid receptacle is positioned beneath the closet bowl and through said receptacle extends in the vertical direction a discharge pipe which at its lower end opens into a sludge tank and which has its upper end positioned vertically below the lower opening of the closet bowl. A disclike valve is adapted to provide preferably airtight sealing of the upper end of the discharge pipe.

3,577,569
TOILET APPARATUS
Ronald J. Sargent, Ann Arbor; Charles L. Sargent, Ypsilanti; Frank T. Sargent, Clio, and John A. Hoffman, Brighton, Mich., assignors to Thetford Corporation, Ann Arbor, Mich.
Filed Mar. 21, 1969, Ser. No. 809,225
Int. Cl. E03d *11/10, 11/08*
U.S. Cl. 4—79 **11 Claims**

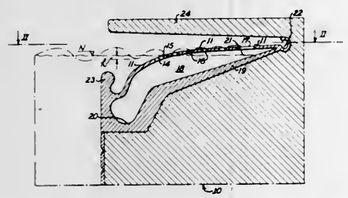
A toilet having a flushing apparatus whereby a fixed

volume of water is discharged from a single nozzle into the



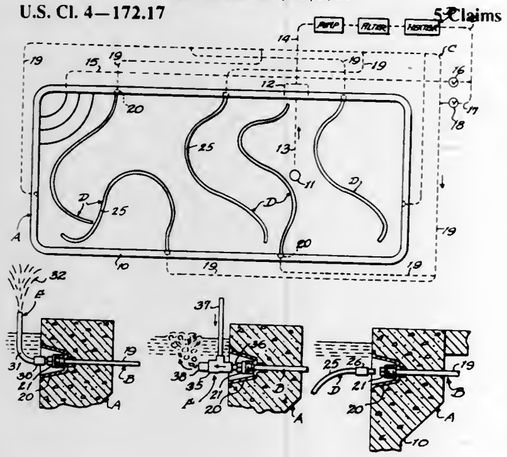
bowl of the toilet in a vortex pattern.

3,577,570
SWIMMING POOLS
Georges Vincent, Grenoble, France, assignor to Societe Grenobloise d—Etudes et d'—Applications Hydrauliques (Sogreah), Grenoble, France
Filed Mar. 8, 1968, Ser. No. 711,628
Claims priority, application France, Mar. 8, 1967, 5070
Int. Cl. E04h *3/18*
U.S. Cl. 4—172.17 **12 Claims**



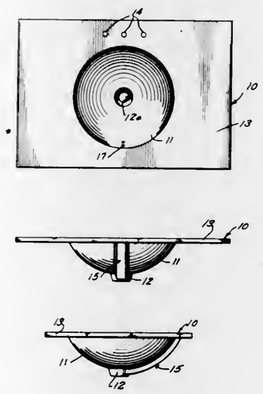
The swimming pool is provided with edges having a gentle slope with respect to the static water surface in the pool so that wave reflection from the edges of the pool is eliminated.

3,577,571
COMBINATION CLEANING, FOUNTAIN AND THERAPEUTIC WHIRLPOOL APPARATUS FOR SWIMMING POOLS
Bernard Bellinson, Sherman Oaks, and Henry R. Young, Arleta, Calif., assignors to Marine Swimming Pool Equipment Co., North Hollywood, Calif.
Filed Mar. 19, 1969, Ser. No. 808,630
Int. Cl. E04h *3/16, 3/18*
U.S. Cl. 4—172.17 **5 Claims**



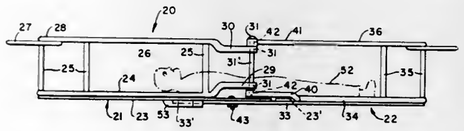
A swimming pool having in its sidewall a plurality of water-delivery outlet sockets; in combination with selectively attachable cleaning hoses of the jet-propelled type, fountain heads for converting the water flow into a series of fountain sprays during nonuse of the cleaner hoses, and therapeutic jet nozzles for converting the flow into a water and air bubble mixture for "whirlpool" agitation of the water.

3,577,572
INTEGRAL LAVATORY BOWL AND VANITY TOP COMBINATION
Kay L. Ruggles; Dale B. Gunnerson, and Howard S. Clark, Salt Lake City, Utah, assignors to American Standard, Inc., New York, N.Y.
Division of Ser. No. 606,324 Dec. 30, 1966, Pat. No. 3,433,860. Filed Jan. 21, 1969, Ser. No. 872,779
Int. Cl. E03c *1/18;* **A47k** *1/04*
U.S. Cl. 4—187 **6 Claims**



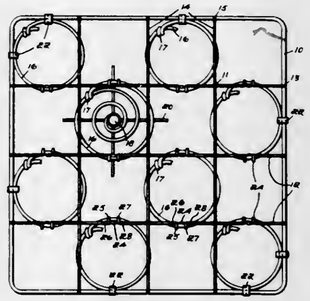
The Article of Manufacture comprises an integral lavatory bowl and vanity top combination of a thermosetting synthetic plastic composition, preferably of the polyester resin type, wherein the bowl area is integrally formed with the vanity top area. The bowl area may be provided with a preformed overflow tube which is embedded within the material of the sidewall of the bowl.

3,577,573
AMBULANCE STRETCHER DEVICE
Wencle J. Mrnak, Bowman, N. Dak.
Filed Feb. 14, 1969, Ser. No. 799,346
Int. Cl. A47b *83/04*
U.S. Cl. 5—82 **2 Claims**



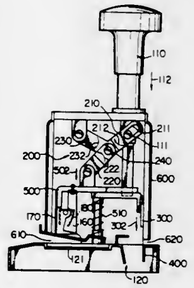
The invention comprises an ambulance stretcher having a pair of sections with bottom support plate members in each section disposed in horizontal planes, said bottom support members having their inner edges overlapping in flush relationship to one another, a pin pivotally connecting said bottom members together along their overlapping portions whereby one section may be pivoted relative to the other section in a horizontal direction to facilitate transporting the stretcher about sharp corners.

3,577,574
SPRING ASSEMBLY FOR FURNITURE AND METHOD OF MANUFACTURE
Fred A. Ciampa; Angelo Serafini, and Louis Mazzarella, Boston, Mass., assignors to Standard Box Spring Co., East Boston, Mass.
Filed Jan. 3, 1969, Ser. No. 788,893
Int. Cl. A61j *19/00*
U.S. Cl. 5—267 **6 Claims**



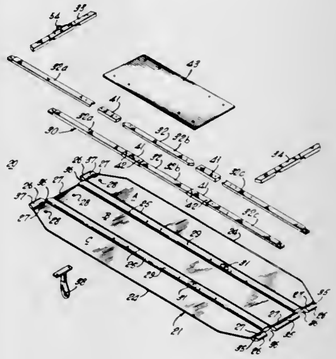
A spring assembly for bed springs or other furniture is prepared from wires having a series of longitudinally spaced return bends. Two groups of wires are welded in right angular relation to form a planar wire mesh. The return bends are located in at least one group of the wires, and form pairs of channels which are open in a direction normal to the plane of the mesh. The mesh is inverted with the channels open upwardly, and a number of coil springs are positioned on it, with the upper convolution of a coil spring inserted into each pair of channels. The return bends are then bent over the convolutions to lock them to the mesh. The free ends of the springs of the resulting spring assembly are then attached to a frame in a conventional manner.

3,577,575
BINDING AND OPENING DEVICE
Fumio Taniguchi, 2-3 Ueno-cho-3-chome, Tajimi-shi, Japan
Filed Feb. 28, 1969, Ser. No. 803,183
Claims priority, application Japan, Mar. 29, 1968, 43/20001
Int. Cl. B25b *27/14;* **B26b** *27/00;* **B31f** *5/02*
U.S. Cl. 7—14.1 **7 Claims**



The binding device has a cutter for making a U-shaped slot in papers, a cam for bending down the U-shaped portion of the papers, and a knife for making an I-shaped slot in the papers and for inserting the portion into the I-shaped slot. The binding and opening device has a plurality of sets of the cutter, cam, and knife and further has a pair of edges for opening a letter.

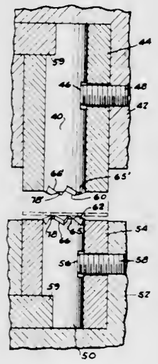
3,577,576
COLLAPSIBLE SURFBOARD OR SAILBOAT
Edward Vernon Lobb, Port Murray, N.J., and Raymond W. Coburn, Jr., New York, N.Y., assignors to Colgil Enterprises, Inc., Oyster Bay Cove, N.Y.
Filed June 24, 1969, Ser. No. 836,115
Int. Cl. B63b *7/00, 35/00*
U.S. Cl. 9—2A **9 Claims**



The present invention relates to a collapsible vessel having an inflatable hull which is suitable for use as a surfboard or sailboat. The inflatable hull is formed of a flexible sheet material such as polyvinyl chloride and incorporates inflatable air and watertight compartments therein which are interconnected by chambers or pockets to receive and hold rigid reinforcing elements in place relative to the hull.

The reinforcing elements extend lengthwise of the hull and may be interconnected by crossmembers to form a rigid reinforcing frame. Both the hull and the reinforcing elements are collapsible for purposes of transportation and storage. Components which enable the hull to be utilized as a sailboat are attached to and are supported by elements of the reinforcing frame.

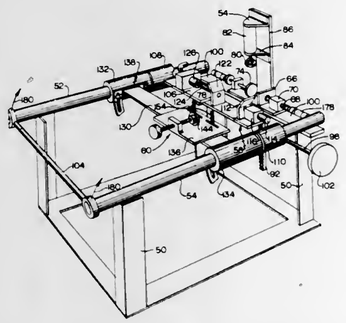
3,577,577
LOCK WASHER
Alfred M. Zak, 6110 Casmere Ave., Detroit, Mich.
Filed May 13, 1969, Ser. No. 824,192
Int. Cl. B21d *53/20*
U.S. Cl. 10—73 **12 Claims**



An electrical connector formed with a lock washer portion having a plurality of inwardly extending locking tabs. Each tab is formed into a bent configuration between a punch and

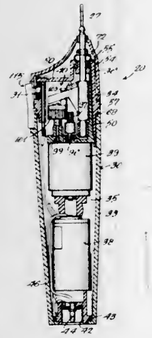
die which are so shaped that each tab remains integrally connected throughout its circumferential extent with the body portion of the lock washer section by a bend line with one side edge portion of each tab projecting above and the other below the plane of the body portion of the washer.

3,577,578
SHOE LAST REMODELING JIG
Arthur P. Alexander, Hingham; Steven R. Aronson, Mattapan, and Charles F. Langenhagen, Jr., South Weymouth, Mass., assignors to Packaged Resins Company Inc., Braintree, Mass.
Filed Mar. 5, 1969, Ser. No. 804,479
Int. Cl. A43d *3/00*
U.S. Cl. 12—146 **27 Claims**



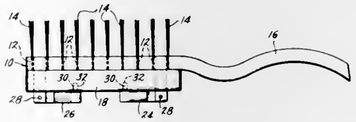
A method and apparatus for fitting, in predetermined registration, a mold cap to the toe end of a last which is supported in a predetermined position and orientation. Gauges, adapted to contact the last at predetermined locations about its bottom pattern, are adjustable to the particular bottom pattern to insure that successive lasts of the same size and style will be supported in the same position and orientation. A mold cap gauge supported is also provided to support successive mold caps repetitively in the same orientation with respect to that of the supported last. The last and mold caps are then combined while in their respective, proper orientations to insure proper and uniform registration.

3,577,579
ELECTRIC TOOTHBRUSH
John P. Duve, 8625 Parkview Ave., Brookfield, Ill., and Douglas E. Beck, 3001 S. King Drive, Chicago, Ill.
Division of Ser. No. 824,110, May 13, 1969, filed Oct. 29, 1969, Ser. No. 872,255
Int. Cl. A46b *13/00*
U.S. Cl. 15—22 **12 Claims**



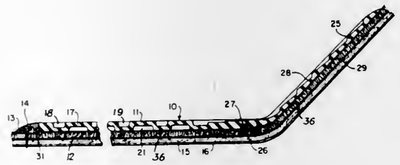
An electric cordless toothbrushing device having a power handle with a drive shaft extending from one end thereof and a toothbrush attachment which is securable to the remote end of said shaft. The power handle includes a battery-powered motor which by means of a motion-converting mechanism drives the shaft so that the rotary power of the motor is translated to an orbital motion at the toothbrush attachment. An improved electric switch is provided to control the energization of the motor.

3,577,580
SELF-CLEANABLE HAIR BRUSH
Robert B. Rand, P.O. Box 2461, Charleston, W. Va.
Filed July 18, 1969, Ser. No. 842,140
Int. Cl. A46b *17/06*
U.S. Cl. 15—169 **2 Claims**



A self-cleanable hair brush comprising a main body portion having a handle at one end, a back normally disposed in contact with one side of said main body portion, tufts of bristles secured to said back and extending through openings in said body portion, a plurality of pins rigidly secured to said body portion and normally extending through apertures provided in said back, and a U-shaped clip member pivotally secured to each pair of pins, said clip members in normal operative position of the brush being secured to the upper side of said brush, and said clip members being pivotable to a position in which the legs of the U are in alignment with said pins whereby said back and said body member may be moved away from each other to a brush cleaning position in which the crossmembers of the U-shaped clip members constitute abutments limiting movement so that the back does not become disengaged from the tufts of bristles.

3,577,581
SHOE SCRAPER FLOOR GRATINGS FOR AUTOMOBILE FLOORS
Stanley S. Stata, Rockford, Ill., assignor to Andrew F. Winterconn, Rockford, Ill., fractional part interest to each
Filed July 17, 1969, Ser. No. 842,605
Int. Cl. B62d *25/20;* **B60n** *3/06*
U.S. Cl. 15—215 **13 Claims**

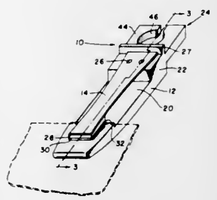


This vehicle floor mat consists of a rigid frame secured to the floor, and a mat of flexible material including a pan having a shoe scraper means therein, whereby dirt and moisture scraped from shoes is retained in the pan, and interfitting portions on the marginal edge portions of the pan and in the frame providing for detachably securing the pan in the frame against displacement from its position on the carpet these portions being designed to have a snap fit. A front cross portion on the frame in one form underlies the junction of a toeboard extension with the pan so as to allow free drainage of moisture from the toeboard extension into the pan over this cross portion.

3,577,582
METHOD OF MAKING AN APPLICATOR FOR COSMETICS
Bruno D. Aston, 14211 Skyline Drive, Hacienda Heights, Calif.
Continuation of application Ser. No. 660,124, Aug. 11, 1967, now abandoned. This application Apr. 11, 1969, Ser. No. 816,183
Int. Cl. A47k *7/02*
U.S. Cl. 15—244 **4 Claims**

An applicator element mounted on a handle to serve the general purpose of a brush comprises a bulbous body of a soft, resilient, foamed plastic with the cells open to provide communication among the cells and to provide numerous minute outwardly open cavities formed by the outer cells. The applicator element is of folded construction. Preferably, a stiffener element is enclosed by the foamed plastic applicator element and is substantially smaller in cross-sectional area than the applicator element.

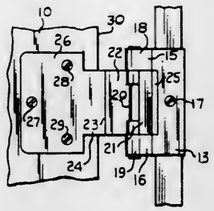
3,577,583
MAGNETIC CLAMP
Willard R. Amann, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Nov. 29, 1968, Ser. No. 780,016
Int. Cl. E05d *13/02*
U.S. Cl. 16—87.2 **9 Claims**



A clamp for releasably holding sheet material includes a rigid base of nonmagnetic material and an elongated strip of flexible material. The base carries a permanent magnet at one end, and the elongated strip is attached to the other end of the base and carries a second permanent magnet overlying the permanent magnet in the base. A recess is formed in the base underlying the central portion of the strip in such a manner that, by depressing that portion of the strip, the magnets are caused to part permitting insertion or removal of a piece of sheet material.

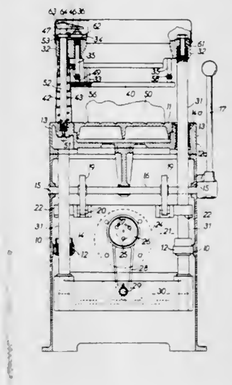
3,577,584
HINGE FOR CABINET DOOR
Louis E. Himelreich, Louisville, Ky., assignor to H. J. Scheirich Company, Louisville, Ky.
Filed July 22, 1969, Ser. No. 843,703
Int. Cl. E05d *5/06*
U.S. Cl. 16—135 **2 Claims**

A hinge for mounting a door on a cabinet stile requires only a single-mounting fastening entering the stile and is illustrated with respect to a stile formed of folded material and



having a door overlying the edge of the stile while in closed position.

3,577,585
MEAT-TENDERIZING MACHINE
Fernand Stanislas Allinquant, 53 Avenue LeNotre, Sceaux, France
Filed July 18, 1968, Ser. No. 745,758
Int. Cl. A22c *9/00*
U.S. Cl. 17—25 **8 Claims**

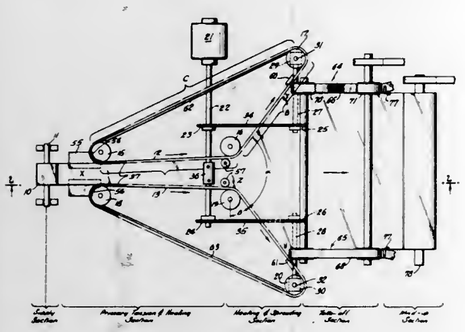


The invention relates to a meat-tenderizing machine comprising stationary columns, a grid pressing upon the piece of meat which, owing to inclined hinged rings rubbing against the columns, should be maintained in position while the tenderizing blades are pulled upwardly out of the piece of meat, the improvement being that the columns bear at these tops owing to which the grid is prevented from ascending beyond a given topmost position, should the grid accompany the blades in their ascending movement in spite of the inclined rings.

3,577,586
APPARATUS FOR CONTINUOUSLY TRANSVERSELY STRETCHING ORIENTABLE SHEET MATERIAL
Frank Kalwaites, Somerville, and Peter L. Doviak, Kendall Park, N.J., assignors to Johnson & Johnson
Filed Dec. 20, 1967, Ser. No. 692,006
Int. Cl. B29g *7/00*
U.S. Cl. 18—1 **8 Claims**

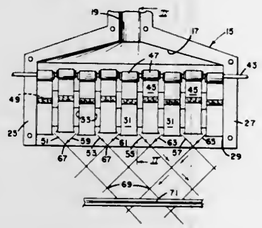
Method and apparatus for transversely stretching sheet material wherein the material is moved in its longitudinal direction, tension is applied in the transverse direction, the material heated and uniformly stretched in its transverse direction at a rate sufficient to orient the material. After the material is uniformly transversely stretched the desired amount the edges of the material are kept parallel and the material cooled. The apparatus comprises means for applying tension in the transverse direction of continuously moving sheet material, means for heating the material while said ten-

sion is applied, a pair of diverging conveyors which diverge at an angle greater than 40°, the diverging conveyors having clamping means which clamp the edges of the material to uniformly transversely stretch the material as the conveyors



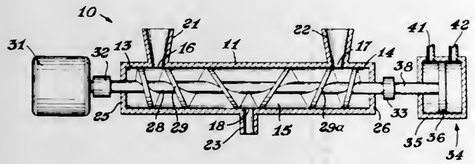
diverge and means for removing the continuously moving sheet material from the clamping means of the diverging conveyors while maintaining the edges of the material substantially parallel and under control.

3,577,587
APPARATUS FOR MAKING RETICULATED STRUCTURES
Theodore H. Fairbanks, West Chester, Pa., assignor to FMC Corporation, Philadelphia, Pa.
Filed Nov. 22, 1968, Ser. No. 778,134
Int. Cl. B29f *3/04*
U.S. Cl. 18—12 **7 Claims**



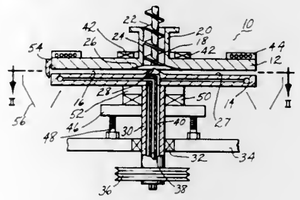
Apparatus for making reticulated structures by periodically contacting adjacent streams of a series of generally like streams of flowable material as they are extruded along sinuous paths, and thereafter setting the extruded streams.

3,577,588
EXTRUSION APPARATUS
Douglas S. Chisholm, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed May 5, 1969, Ser. No. 821,827
Int. Cl. B29f *3/01*
U.S. Cl. 18—12 **8 Claims**



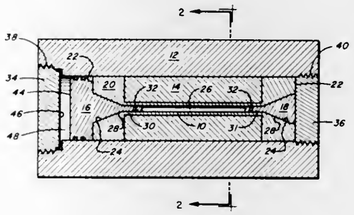
A screw having increasing lead or pitch is employed on an extruder with central feed or discharge to provide a self-balancing extrusion apparatus which does not require heavy thrust bearings.

3,577,589
APPARATUS FOR INCREASING THE DENSITY OF THERMOPLASTIC FOAM
Mario Serrano, and William D. Wolf, Simsbury, Conn., assignors to Monsanto Company, St. Louis, Mo.
Division of Ser. No. 705,443, Fev. 14, 1968, abandoned. Filed Mar. 12, 1969, Ser. No. 827,081
Int. Cl. B29f *3/02*
U.S. Cl. 18—125M **4 Claims**



A method and apparatus for densifying thermoplastic foam wherein the foam cells are crushed by mulling within a narrow chamber formed by plates or members mounted for relative rotation with respect to each other. The densified foam emerges as a high density curdlike extrudate at the periphery of the members.

3,577,590
HIGH-PRESSURE CHAMBER
Victor C. D. Dawson, Silver Spring, and Arnold E. Seigel, Chevy Chase, Md.
Filed June 27, 1968, Ser. No. 740,606
Int. Cl. B29c *3/00*
U.S. Cl. 18—16.5 **3 Claims**

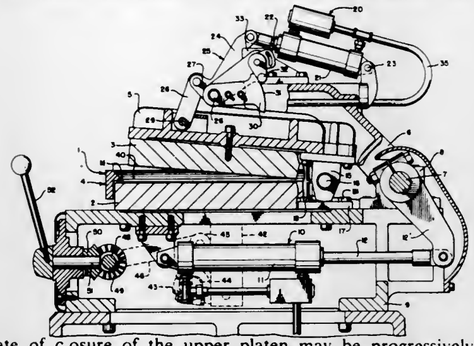


A high-pressure chamber having an inner tubular member circumscribed by a concentric outer tubular member of fully autofrettaged fabrication with a segmented circumferentially complete cylinder of high compressive strength material extending between the inner and outer tubular members.

3,577,591
FLAT BED TYPE CASTING MACHINE IMPROVEMENTS
Charles L. Ricards, South Plainfield, and Daniel McColley, Plainfield, N.J., assignors to Wood Industries, Inc., Plainfield, N.J.
Filed Mar. 29, 1968, Ser. No. 718,027
Int. Cl. B29h *5/00*
U.S. Cl. 18—17 **6 Claims**

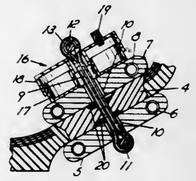
A casting machine for casting thin plastic articles having a flat lower platen and a moveable upper platen closing with

the lower platen with a clamshell motion and having fluid motor means associated with the upper platen whereby the



rate of closure of the upper platen may be progressively varied. A floating clamping frame associated with the lower platen for securing a matrix to the lower platen.

3,577,592
APPARATUS FOR REPAIRING TIRE CASINGS
Benjamin Whittle, R.R. #3, Paw Paw, Mich.
Filed Jan. 10, 1969, Ser. No. 790,198
Int. Cl. B29h *5/16*
U.S. Cl. 18—18 **6 Claims**

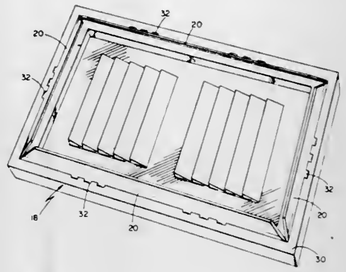


Flexible plug rubber is cured into the void formed by retaining the rubber between inner and outer plates, while holding the plates together by tension strands passed through the casing. The strands are cut off after the plug is set. The strands may pass centrally through the void and the plug material, or in spaced relation through uninjured parts of the casing.

A variation shows the tension strand also passing through an inner patch so that the patch is attached to the inside of the casing at the same time that the plug rubber is cured in place.

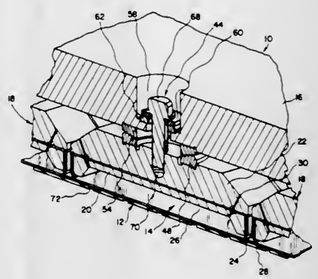
3,577,593
APPARATUS FOR HEAT AND VACUUM-PRESSURE MACHINE MOLDING
James W. Jackson, East Walpole, Mass., assignor to Bird & Son, Inc., East Walpole, Mass.
Filed Oct. 29, 1968, Ser. No. 771,576
Int. Cl. B29c *17/04, 23/00*
U.S. Cl. 18—19 **7 Claims**

Apparatus and methods for heat and vacuum-pressure machine molding of hollow articles from thermoplastic sheet material, involving a mold (normally with alternate vacuum and air pressure sources) having one or more relatively movable complementary molding members for forming undercut, reverse band, flanged or reentrant portions of said articles, with said member or members being mounted for relative movement, with respect to the molding surface of the mold, into molding position, and thereafter out of such molding position so that a molded article may be freely removed from said mold, said complementary molding member or members being preferably actuated by or through contact with and relative movement of the plastic sheet material by



vacuum, with or without the aid of a plug-assist, e.g. where a female external mold is employed.

3,577,594
APPARATUS FOR FORMING HOLLOW ARTICLES
John D. Al-Roy, Union City, N.J., assignor to Monsanto Company, St. Louis, Mo.
Filed Dec. 30, 1968, Ser. No. 787,840
Int. Cl. B29c *17/04, 3/02, 1/16*
U.S. Cl. 18—19 **8 Claims**

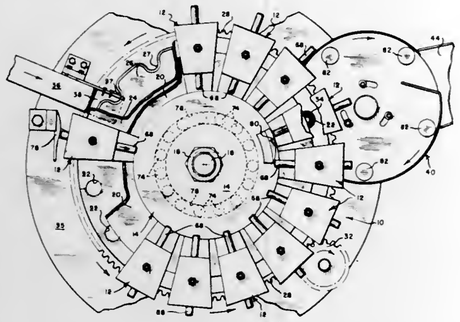


Apparatus for thermoforming synthetic plastic sheet material into hollow articles includes a platen member providing a rigid surface and a mold member having the desired cavity and a cutting blade edge. The two members are movable relative to each other and one of the members is mounted for pivotal movement relative to the other about the axis of movement of the movable member so as to accommodate misalignment of the two members.

3,577,595
ROTATABLE CROWN-FILLING MACHINE AND METHOD FOR APPLYING SEALING RINGS OF PLASTIC TO THE PERIPHERY OF THE CROWN INTERIOR
Donald C. Smith, Pottsville, and Robert E. Koshada, Orwigsburg, Pa., assignors to Zapata Industries, Inc., Frackville, Pa.
Filed Aug. 26, 1968, Ser. No. 755,244
Int. Cl. B29c *3/00*
U.S. Cl. 18—20 **9 Claims**

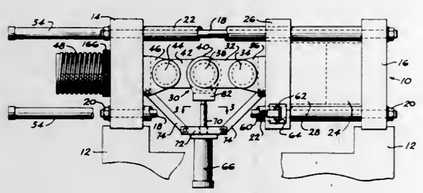
A machine for forming sealing rings in container closures comprising a rotatable-type carrier having a multiplicity of locations for receiving closures to be provided with sealing rings, means at each location for supplying a stream of fluid gasket-forming material to the peripheral portion of each closure at each location, means for rotating each closure on its axis a plurality of times during the supply of said stream thereto and means for controlling the delivery of said stream

of gasket material to each closure on the carrier while it is rotating a predetermined plurality of times, so that a ring of



gasket material of substantially uniform dimensions throughout is deposited in each closure.

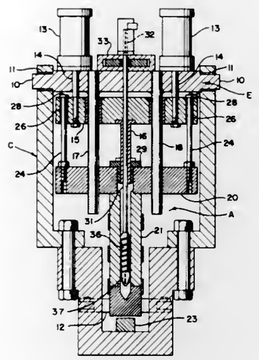
3,577,596
TWO-PHASE MOLD PRESS
Calvin P. Bullard, East Longmeadow, and Francis P. Szubelick, Springfield, Mass., assignors to Vigeant Gaston, East Longmeadow, Mass., a fractional part interest
Filed June 26, 1968, Ser. No. 740,179
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 **10 Claims**



A two-stage power-operated press for closing molds as used in the manufacture of plastic articles by injection molding. The press incorporates a first fluid motor means for advancing and retracting the movable platen at a rapid traverse rate at relatively low pressure and a second fluid motor means for imparting a high-locking pressure to the movable platen at the end of its stroke in order to close the mating mold segments carried by the movable and fixed platens, respectively. The arrangement of the operating parts of the press is such as to achieve maximum platen stroke in order to obtain increased mold opening for accommodating molds for the manufacture of deep-draw articles.

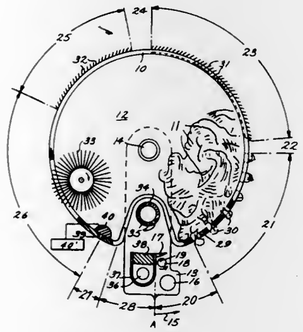
3,577,597
SUPPORT FOR INJECTION-MOLDING MACHINE
Donald A. Draudt, 27180 Pompton Drive, and Herbert T. Draudt, 28520 Lynhaven, North Olmsted, Ohio
Continuation-in-part of application Ser. No. 551,386, May 19, 1966, now Patent No. 3,406,429. This application Sept. 20, 1968, Ser. No. 761,095
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 **4 Claims**

Apparatus for molding articles from thermoplastics wherein the moldable plastic material is plasticized and injected into a mold cavity. The plasticizing and injecting unit is pivotally mounted in a frame fixed relative to the mold and



the unit may be released at one end of the frame and swung away from the mold to facilitate cleaning.

3,577,598
APPARATUS FOR THE AUTOMATIC DETERMINATION OF FIBER LENGTH DISTRIBUTION OF A FIBER POPULATION
Eric Schwarz, 9 Hochstrasse 8044, Zurich, Switzerland
Filed Nov. 13, 1968, Ser. No. 775,411
Claims priority, application Austria, Nov. 17, 1967, 10373/67
Int. Cl. D01h *19/00*
U.S. Cl. 19—65 **9 Claims**

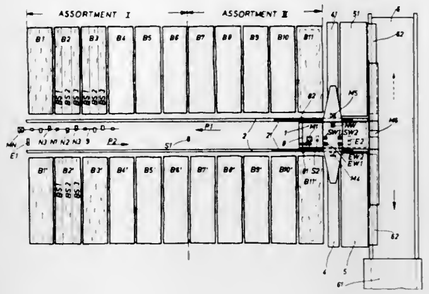


A drum containing fibers has a perforated wall portion swept exteriorly by a comb which picks up protruding fibers and forms a beard. Carding means on a successive wall portion is swept by the comb to parallelize the fibers in the beard. The comb sweeps past another successive wall portion where the beard is scanned optically to develop electric signals which are a function of the fibers in the beard. The beard is removed as the comb sweeps past another successive wall portion. Whereupon the cycle can be repeated.

3,577,599
APPARATUS FOR MIXING FIBROUS COMPONENTS
Georg Goldammer, Ingolstadt, and Gunther Mahrt, Etting, Germany, assignors to Schubert & Salzer Maschinenfabrik Aktiengesellschaft, Ingolstadt, Germany
Filed Jan. 16, 1969, Ser. No. 792,234
Int. Cl. D01g *13/00*
U.S. Cl. 19—145.5 **7 Claims**

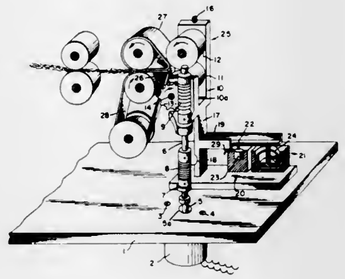
The invention relates to a process for the accurate mixing

of fibrous components in a predetermined ratio, and to ap-



paratus for the performance of the process.

3,577,600
APPARATUS FOR RAPID AUTOMATED MEASUREMENT OF DRAFTING FORCE AND DRAFTING FORCE VARIABILITY
John S. Graham, Clemson, S.C.
Filed Sept. 26, 1968, Ser. No. 762,951
Int. Cl. D01h *5/18*
U.S. Cl. 19—293 **1 Claim**



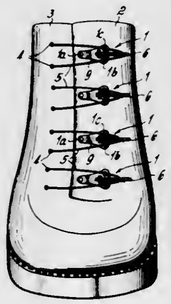
An apparatus for measuring the drafting force and drafting force variability in conventional drafting systems. The force sensing assembly together with the drafting rolls and the associated roll driving mechanism of the apparatus are oscillatingly supported on a resilient directionally restricted pivot, so that drafting force is transformed into bending movement which movement causes angular displacement of the assembly around the resilient pivot as a center. Force measurement is accomplished via an electronic strain gauge. The electrical signals generated by the strain gauge are employed as analogs of drafting force and drafting force variability and accordingly analyzed automatically or semiautomatically.

3,577,601
ARTICLE FASTENING DEVICE
Remo Mariani, Berkeley Heights, and George H. Geisinger, Union County, N.J., assignors to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Mar. 12, 1969, Ser. No. 806,369
Int. Cl. B65d *63/00;* **A61b** *17/08*
U.S. Cl. 24—16 **11 Claims**

The disclosure is directed to a device for fastening two or more articles together and which does not require threading apertures. The device is constructed of a generally elongated flexible body portion terminating at a first end in a head member having a transverse aperture therein to permit passage of the body portion therethrough. The opposite end of the body portion terminates in a substantially rigid tail end portion having thereon a cutting edge such as a point. The tail end portion is generally formed in an arcuate manner to facilitate its being returned through the article once it has been inserted therein. The tail end portion may be provided in one of three ways; (1) a preformed metallic member is joined to the end of the body portion; (2) the end of the

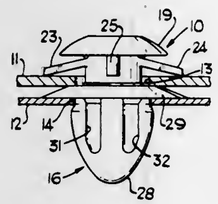
body portion is cold worked or otherwise treated in order to increase its physical strength and rigidity; or (3) the cold worked, or treated, tail end portion is plated with a metallic plating. Additionally the plated tail end portion may be cold worked to further increase its strength and rigidity.

3,577,602
BUCKLE, ESPECIALLY FOR SKI BOOTS
Ferdinand Speichinger, Jestetten, Germany, assignor to Karl Altenburger KG, Jestetten, Baden, Germany
Filed Sept. 23, 1968, Ser. No. 761,741
Claims priority, application Germany, Sept. 27, 1967, P 16 85 786.6
Int. Cl. A43c *11/14*
U.S. Cl. 24—70 **1 Claim**



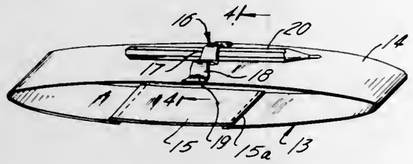
A shoe buckle, especially for ski boots, which includes: an approximately triangular plate, and bearing means connected to said plate and having a substantially U-shaped contour, said bearing means comprising two-spaced supporting members at least approximately perpendicular to the respective adjacent major surfaces of said plate and provided with axially aligned bores for receiving a pivot pin, said bearing means also comprising a flat arm integral with said supporting members and forming the transverse arm of said U-shaped contour, said flat arm being spot-welded to said plate at an area thereof which is wider than the length of said flat arm.

3,577,603
FASTENER
Clifford Alexander Seckerson, Iver Heath, and Robert C. Collyer, Harefield, England, assignors to United-Carr Incorporated, Boston, Mass.
Filed Sept. 29, 1969, Ser. No. 861,749
Claims priority, application Great Britain, Oct. 2, 1968, Oct. 22, 1968, Nov. 11, 1968, June 27, 1969, 46829/68;50022/68;5322568;32682/69
Int. Cl. F16b *21/00;* **A44b** *21/00*
U.S. Cl. 24—73 **13 Claims**



A two-part fastener for attaching two apertured panels together so that one panel is readily removable from the other, the fastener comprising a stud portion having a shank adapted for snap engagement rough a circular aperture in one of the panels, a flange at one end of the shank adapted to abut the outer surface of the said one panel to limit insertion of the shank therethrough and a stud projecting from the opposite side of the flange from the shank and adapted to project outwardly through a circular aperture in the other panel when the other panel is resting on the flange of the stud portion and a socket portion formed with a bore open at one end shaped to receive the stud of the stud portion and with an external flange which is spaced from the said one end of the bore and adapted to clamp the said other panel against the said flange of the stud portion, the stud and the bore in the socket portion being provided with means which interengage when the stud is within the bore to resist withdrawal of the socket portion from the stud.

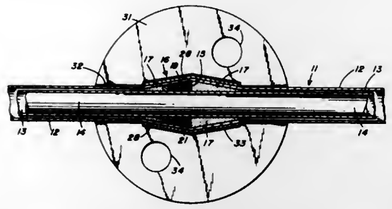
3,577,604
WRITING IMPLEMENT HOLDER FOR BOOKS OR LIKE ARTICLES
Jeffrey Owen Brosk, 150 E. 69th St., New York, N.Y.
Filed Sept. 4, 1968, Ser. No. 757,432
Int. Cl. A44b *21/00*
U.S. Cl. 24—81 **5 Claims**



An elastic holder for writing implements adapted to encompass a book and capable of use as a bookmark.

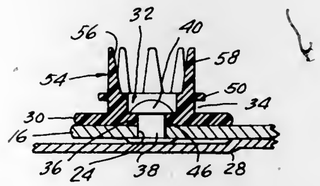
3,577,605
TOW CABLE TERMINATION
Raymond C. Fischer, Severna Park, and Norton J. Levenson, Baltimore, Md.
Filed Mar. 25, 1969, Ser. No. 810,268
Int. Cl. F16g *11/00*
U.S. Cl. 24—114.5 **2 Claims**

This invention is concerned with a termination to be applied to a double stranded counterwound electromechanical tow cable. By the insertion of a wedgelike member between the strands a hump is built into the cable which may be gripped at the point of the hump by a split tow ball without



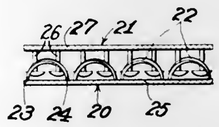
chance of slipping of the strands, while still permitting even winding of the cable on a winch.

3,577,606
STRING AND THE LIKE DETENTION SYSTEM
Cyril M. Tyrrell, Sr., 13 Kaden Court, Novato, Calif.
Filed Feb. 28, 1969, Ser. No. 810,081
Int. Cl. F16g *11/00*
U.S. Cl. 24—117 **10 Claims**



A string and the like detention system particularly suited for detention of shoe laces in a selective secured and releasable condition with respect to a shoe including a spoollike lashing button fixed to an article and including a circular base, a centrally open circular hub portion above and integral with the base, a flange integrated with and positioned above the hub and vertically spaced from the base, a plurality of resilient members in the nature of prongs being secured peripherally around, and on the upper surface of, the flange, a recess is provided in the periphery of the flange adapted for coacting with guide means on the base, and constituting a guide for passage therethrough of an end of the string and the like, for subsequent winding of the string about the hub and the prongs, following insertion of a string end through the guide means on the base and the recess in the flange for releasable detention of a string end, release being effected by inward pressure on the resilient prongs to permit the wound string end to be vertically lifted from engagement with the prongs and subsequent removal from the button.

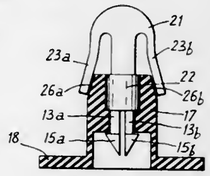
3,577,607
SEPARABLE FASTENING FABRIC
Yasaburo Ikoma, and Ikuta Yabu, Sumiyoshi-ku, Osaka, Japan, assignors to Ikoma Orimono Co., Ltd., Osaka, Japan
Filed June 13, 1968, Ser. No. 736,838
Claims priority, application Japan, June 19, 1967, 52414
Int. Cl. A44b *17/00*
U.S. Cl. 24—204 **6 Claims**



A separable fastening fabric for engagement of a first and second fabric in face-to-face relation comprising a number of

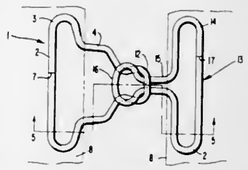
fiber loops in the shape of curved bridges outstanding from the first fabric and a number of engaging projections outstanding from the second fabric which engage to said fiber loops, two feet of each fiber loop being fixed onto the first fabric with an interval from each foot, said fiber loops being crossed zigzag one another. Owing to the above-mentioned structure, two fabrics of the separable fastening fabric easily engage, the engaging strength is high and also durability of the separable fastening fabric is long.

3,577,608
SEPARABLE FASTENER ELEMENTS
Jean Pierre Texler, Neullly, France, assignor to Societe Gobin Daude (Societe Anonyme), Paris, France
Filed Dec. 16, 1968, Ser. No. 784,026
Claims priority, application France, Dec. 14, 1967, 132,317
Int. Cl. A44b *17/00*
U.S. Cl. 24—221 **2 Claims**



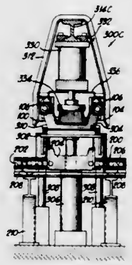
The device of this invention includes preformed plastic fastener elements, one of which includes a socket containing diametrically opposed rigid means disposed therewithin and the other including an operator which is assemblable into locking engagement with the rigid means, said operator including bendable bifurcated leg means including lock means for securing said operator relative to said socket to permit relative rotation between the socket and the operator in order to permit assembly of an eyelet over the perimeter of said socket.

3,577,609
HOOK AND EYE TYPE FASTENER
Franz Gottfried, Stolberg-Dorff, Germany, assignor to Firma Kurt Dorpinghaus, Huckeswagen, Germany
Filed Mar. 7, 1969, Ser. No. 805,256
Claims priority, application Germany, Mar. 8, 1968, D37699
Int. Cl. A44b *13/00*
U.S. Cl. 24—228 **1 Claim**



The fastener consists of interlocking hook and eye elements. The eye element comprises a closed loop of resilient wire. The loop is intended to form merging curved and stepped formations to provide an end portion which is secured to the fabric, and intermediate portion and an eye. The loop is further indented at the junction of the intermediate portion and eye to provide an opening of a given dimension. The hook element is also a closed loop having an end portion to be secured to the fabric, a neck portion slightly larger than the opening in the eye element, and a hook which can pass through the intermediate portion. The edge of the eye is angularly bent to the extent of the diameter of the wire. The neck is indented to a depth equal to the diameter of the wire. To close the fastener, the hook is inserted within the intermediate portion, and upon the closing movement, the neck spreads the opening to permit the neck and the hook to pass into the eye. The opening returns to its initial dimension, thereby retaining the parts in closed position. In the closed position, the bent edge lies within the indentation to permit the alignment of the elements to present a flat closure.

3,577,610
APPARATUS FOR MANUFACTURING PRESTRESSED CONCRETE MEMBERS
Stanley V. Margolin, Auburndale; Paul W. Glaser, Islington, and Leonard V. Gallagher, Wollaston, Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.
Filed Apr. 16, 1968, Ser. No. 721,834
Int. Cl. B28b *15/00, 23/06*
U.S. Cl. 25—2 **16 Claims**

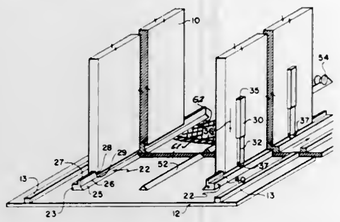


A system for casting prestressed concrete members on a highly automated, mass production basis. The system employs a plurality of portable molds, each of which defines a hollow mold cavity. The portable molds are preferably substantially identical in construction, include open top portions through which charges of concrete mixture can be directed into the mold cavities, and further include means for releasably securing lengths of reinforcing strand in a selected arrangement within each mold cavity. Conveying means carry a plurality of molds simultaneously along a predetermined path of travel through operating stations adapted to subject each mold to a series of successive operations. A mold cleaning and oiling station cleans the interior surfaces of each mold cavity and coats the interior surfaces with a releasing agent. An placement station inserts hardware into the mold cavities, to be cast within the concrete members. A strand placement station emplaces predetermined lengths of reinforcing strand within the mode cavities, and a tensioning station applies a selected pretensioning force to the reinforcing strand. Filling and compacting stations successively feed a measured charge of concrete mixture into each of the molds and compact the concrete charge in the molds. Means are provided to cure the concrete charge within each of the molds after the filling and compacting operations are completed. Conveyor means receive and convey a plurality of the molds simultaneously along a predetermined path of travel after the curing operation is completed. A tension releasing station operates to release the pretensioning load on the reinforcing strand emplaced within each of the molds. Means are provided downstream from the tension releasing station for preparing the molds for the removal of the cast concrete members. A demolding station operates to remove the cast concrete member from each mold. Means are also provided to finish the demolded concrete members and to prepare the empty molds for recirculation through the manufacturing system. In the preferred embodiment each operating station is provided with a portable mold, and the operating stations perform their respective operations substantially simultaneously, within a selected time interval.

3,577,611
CONCRETE SLAB FORMING MACHINE WITH REMOVABLE SOFFIT EDGES
Frederick Maxwell Hewitt, Winnipeg, Manitoba, Canada, assignor to Spiroll Corporation, Ltd., Winnipeg, Manitoba, Canada
Filed July 28, 1967, Ser. No. 656,798
Claims priority, application Great Britain, Aug. 5, 1966, 35186/66
Int. Cl. B28b *7/00*
U.S. Cl. 25—41 **19 Claims**

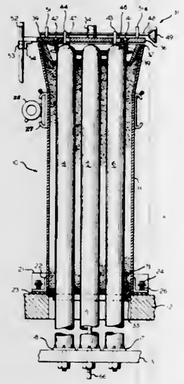
This device is a removable soffit edge for forming accurate, smooth, lower corners to a concrete slab or the like being extruded or slip formed on a bed. It consists of an elongated form placed on the bed and engaged within a groove

on the underside of the side plates of the machine which maintains the parallel relationship of the forms as the machine passes thereover. These forms can be any desired shape and in fact can be extended to act as the sidewalls of a slab if it is desired that the side faces of the slab be accurately and smooth finished. After the slab has been formed and



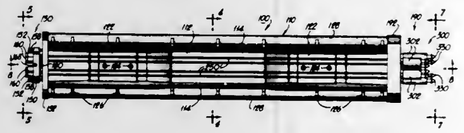
cured sufficiently, the slab can be lifted from the bed leaving the forms in place or, alternatively, the forms can be removed and replaced with forms having a different configuration or different spacing. The device will also permit the use of a different soffit form as either the complete form itself may be replaced or a "liner," such as a plastic or rubber sheet, can be inserted underneath the soffit edges.

3,577,612
APPARATUS FOR MAKING MULTIDUCT CONDUIT
Victor G. Susin, 834 Santa Maria Drive, Naperville, Ill.
Filed Sept. 25, 1968, Ser. No. 763,494
Int. Cl. B28b *7/18, 7/28;* **B28b** *7/06*
U.S. Cl. 25—41 **11 Claims**



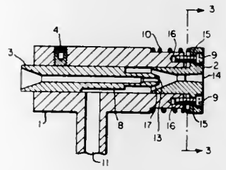
Improved pressure heads and platens for use in concrete conduit mold assemblies. The heads control flexible platens to make it possible to completely fill the end web sections of the molded conduit and nonetheless obviate concrete flashing.

3,577,613
PORTABLE MOLDING APPARATUS
William P. Hidden, Wenham, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.
Filed Apr. 16, 1968, Ser. No. 721,767
Int. Cl. B28b *7/00, 23/06*
U.S. Cl. 25—118 **11 Claims**



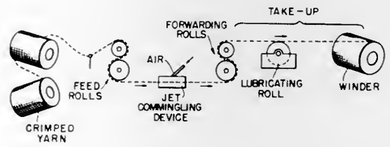
A portable molding apparatus for prestressed concrete members including a hollow mold body for receiving a charge of concrete and reinforcing strand for emplacement in the molded concrete. Mold end members, at least one of which is moveable, define opposite end portions of the body and include strand gripping means to receive and engage a portion of reinforcing strand to retain a strand suspended within the mold cavity. Releasing means provided on each end member are engageable with the gripping means to disengage the gripping means from the strand, and at least one of the end members is moveable with respect to the mold body with the releasing and gripping means engaged so that the strand can be withdrawn from the gripping means and the cast concrete member removed from the mold body.

3,577,614
YARN-TEXTURING JET DEVICE
Samuel T. Price, Wilmington, Del., assignor to E. I. du Pont Nemours and Company, Wilmington, Del.
Filed Nov. 10, 1969, Ser. No. 875,093
Int. Cl. D02g *3/00*
U.S. Cl. 28—1.4 **6 Claims**



Improved fluid jet yarn-texturing devices have a nozzle portion which is moved to a stringup position for sucking a yarn end through the device and is then returned to a preset operating position for texturing the yarn when stringup has been completed.

3,577,615
PROCESS FOR COMINGLING CRIMPED YARN
Fred W. LeNoir, Hopewell, Va., assignor to Allied Chemical Corporation, New York, N.Y.
Division of Ser. No. 535,480 Oct. 21, 1969, Pat. No. 3,473,315 filed June 11, 1969, Ser. No. 840,099
Int. Cl. D02q *1/16*
U.S. Cl. 28—72.12 **4 Claims**

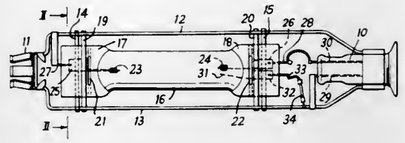


A process is provided for commingling a crimped multifilament yarn in a tubular passageway wherein the yarn is maintained under a slight tension while being subjected to a stream of gas directed against said yarn at an angle whereby substantially all of said gas flows through the tubular passageway countercurrent to the travel of the yarn.

3,577,616
ARC DISCHARGE LAMPS
Kenneth Scott, and Dennis A. Ramsey, London, England, assignors to British Lighting Industries Limited, London, England
Filed Jan. 5, 1968, Ser. No. 696,023
Claims priority, application Great Britain, Jan. 17, 1967, 2491/67
Int. Cl. H01j *9/18, 9/36*
U.S. Cl. 29—25.15 **5 Claims**

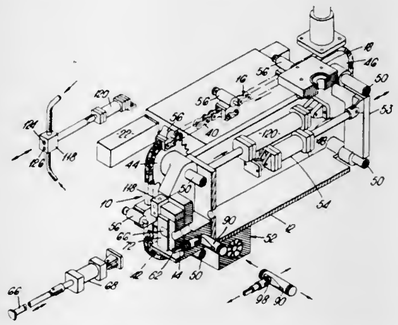
A method of mounting an arc tube, having pinch seals, between two parallel struts by using a staple having a bar

with two legs, passing the legs through the plane of the struts,



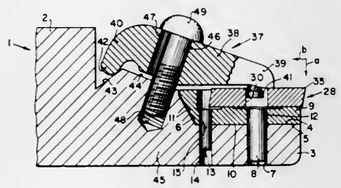
and binding the legs back around the struts to secure the arc tube thereto.

3,577,617
MACHINE TOOLS
William Owen McKenzie Jones, Hurle, Berkshire, England
Filed July 3, 1968, Ser. No. 750,408
Claims priority, application Great Britain, July 12, 1967, 32032/67
Int. Cl. B23b *29/24*
U.S. Cl. 29—54 **10 Claims**



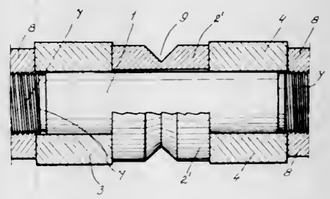
The invention relates to a tool-changing mechanism for use with machine tools and in particular with lathes. The mechanism comprises a conveyor which can carry an unspecified number of tools sequentially to a tool-receiving station at which they are located in order to perform a cutting operation. The tools are intended normally to be preset away from the machine tool and in this condition can be mounted on the conveyor ready for a sequence of machining operations.

3,577,618
TOOLHOLDER CONSTRUCTION
Robert W. Cashman, Saginaw, Mich., assignor to Saginaw Machine and Tool Company, Saginaw, Mich.
Filed Aug. 19, 1968, Ser. No. 753,571
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 **17 Claims**



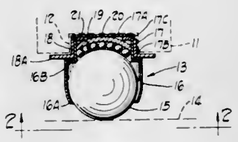
A toolholder comprising an elongated body terminating at its forward end in a recess provided with a rearward arcuate wall and within which is mounted a correspondingly-shaped tool bit support having a pocket defined by a base and a pair of upstanding sides which converge both upwardly and rearwardly. A tool bit having a shape corresponding to the shape of the pocket is removably accommodated in the latter and is provided with a central opening for the reception of a lug formed on a clamp which overlies the tool bit and is anchored to the holder body. The clamp and the clamp anchor are so oriented with respect to the tool bit that anchoring of the clamp causes the latter to rock about a fulcrum in such manner as to urge the tool bit forcibly against the base of the pocket and forcibly against the sidewalls of the pocket.

3,577,619
METHOD OF MANUFACTURING COMPOSITE HARDMETAL ROLLS
Per-Olof Strandel, Nasby Park, Sweden, assignor to Sandvikens Jernverks Aktiebolag, Sandviken, Sweden
Division of Ser. No. 614,227, Feb. 6, 1967, Pat. No. 3,461,527 this application May 12, 1969, Ser. No. 823,629
Int. Cl. B23p *11/00;* **B21b** *27/00, 31/08*
U.S. Cl. 29—148.4 **2 Claims**



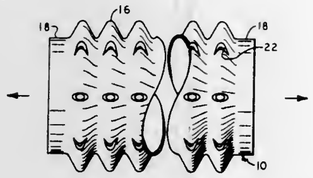
A method for manufacturing working rolls for rolling mills of the type formed by a roll core with a roll ring attached to the core, the roll ring being made of some hard material, such as hard metal or ceramic material. The roll ring is mounted with a clearance fit on the heated roll core and is secured thereto by pressure means which act axially against only the flat end surfaces of the roll ring, the pressure means imparting to the roll ring the force necessary for fixing and prestressing the ring so that it is capable of withstanding the rolling forces.

3,577,620
BALL CASTER AND METHOD MAKING THE SAME
George J. Hoffman, Northfield; William O. Setele, Independence, and Lester E. Law, North Royalton, Ohio, assignors to Kindale Industries, Inc., Independence, Ohio
Division of Ser. No. 774,031, Nov. 7, 1968, Pat. No. 3,514,804, June 2, 1970, this application Aug. 27, 1969, Ser. No. 853,445
Int. Cl. B23p *11/00, 19/00*
U.S. Cl. 29—148.4A **3 Claims**



Method of assembling the caster parts and locking them in assembled condition of a ball-type caster.

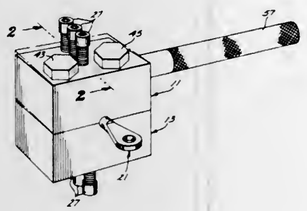
3,577,621
STRETCH METHOD FOR MAKING A TUBULAR PRODUCT
William J. De Gain, Warren, Mich., assignor to Koppy Tool Corporation, Ferndale, Mich.
Continuation-in-part of application Ser. No. 627,718, Apr. 3, 1967, now abandoned. This application May 14, 1969, Ser. No. 824,440
Int. Cl. B23p *17/00*
U.S. Cl. 29—155 **10 Claims**



A tubular metal blank to be formed into a vehicle steering column or other corrugated tubular product is first deformed by radially inwardly moving dies to produce a plurality of substantially equally spaced shallow annular depressions separated by slightly raised crowns. The blank is then axially compressed to form and close a plurality of convolutions under a selected load within predetermined limits and to a selected closed length within predetermined limits, the variations being dependent on the strength of the material. Finally, the blank is stretched, expanding the convolutions to a plurality of generally similar spaced corrugations, with a selected stretch pressure within predetermined limits and to a selected expanded length within predetermined limits. If the end product is used as an energy-absorbing tube, the above method minimizes the variations in a selected compressive axial load required to collapse the finished column.

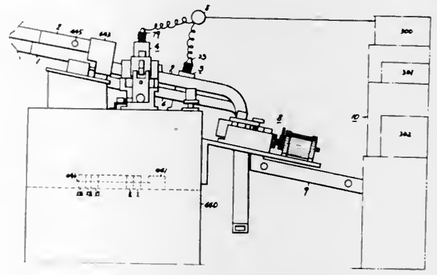
In another embodiment, a series of annularly spaced notches are cut in the convolutions after they have been compressed to abutting configuration to determine the hoop strains developed in the walls of the finished product corrugations when subjected to the axial collapse loading.

3,577,622
SWAGING DEVICE FOR CABLE FITTINGS
Frank E. Shaffer, P.O. Box 1546, Costa Mesa, Calif.
Filed Feb. 20, 1969, Ser. No. 801,070
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 **11 Claims**



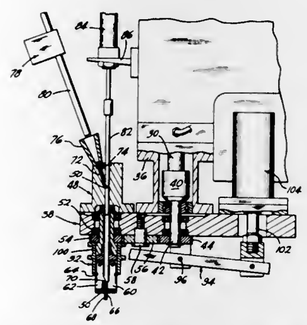
A swaging device for cable fittings which includes a pair of die blocks formed on their adjacent sides with confronting cavities which cooperate to receive and confine the shank of the cable fitting, one of such blocks including a plurality of pin-receiving threaded bores aligned with the cavities and projecting transversely thereof. Means are provided for fastening the blocks together and swaging pins are insertable into the passages whereby the shank of a cable fitting may be placed in the cavity, the blocks secured together, and the pins screwed inwardly in the passages to deform the wall of the shank inwardly to compress the cable while the shank is confined against undue flattening or radially outward deformation.

3,577,623
APPARATUS AND METHOD FOR AUTOMATICALLY ASSEMBLING ANTIFRICTION BEARINGS
Yosio Ono; Hirosi Nakamura; Takasi Inoue; Yosio Horie; Junitiro Matui, and Fumito Uono, Iwata, Shizuoka, Japan, assignors to Toyo Bearing Manufacturing Company Limited, Osaki-shi, Japan
Filed Jan. 30, 1969, Ser. No. 795,162
Claims priority, application Japan, Feb. 3, 1968, Feb. 24, 1968, 43/6853;43/13988
Int. Cl. B23p *19/04;* **B23g** *17/00*
U.S. Cl. 29—201 **11 Claims**



An apparatus for automatically assembling antifriction bearings comprising an electric measuring mechanism for measuring the outer diameter of the groove in an inner ring and deriving an electric signal corresponding to the measured size, an electric measuring mechanism for measuring the inner diameter of the groove in an outer ring and deriving an electric signal corresponding to the measured size, an arithmetic unit for comparing the two measured values derived from said measuring mechanisms and deriving a single electric signal corresponding to the difference between the electric signals, a mechanism for selecting rolling elements to be combined with the pair of inner and outer rings by means of said differential electric signal and counting and storing such rolling elements in order of measurements of successive pairs of inner and outer rings, a mechanism for pairing the measured inner and outer rings, and a mechanism for feeding the selected and counted rolling elements into the eccentric clearance between the thus paired inner and outer rings and incorporating a retainer therein, whereby antifriction bearings are automatically assembled by a series of operations of said mechanisms.

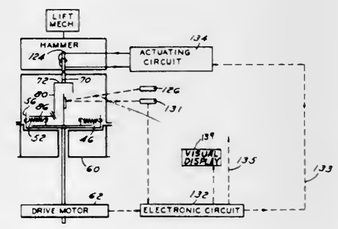
3,577,624
CENTER FEED DRIVER ASSEMBLY
Eugene E. Bentschneider, Manchester, Mich., assignor to Manchester Tool & Die, Inc., Manchester, Mich.
Filed Aug. 19, 1969, Ser. No. 851,317
Int. Cl. B23q *7/10*
U.S. Cl. 29—211 **11 Claims**



Stud driving apparatus that includes a center feed driver which has a center bore into which studs can be fed singly, and a positioning rod which is movable in the bore relative to the driver for positioning the stud at one end of the driver.

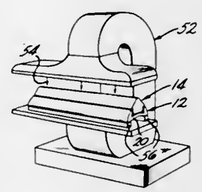
Spring actuated jaws are pivotally mounted in the driver for holding the first of the studs in a fixed position in the bore during the driving operation. The positioning rod is mounted relative to the driver so that when the latter moves toward the workpiece into which the stud is to be driven, the positioning rod will move relative to the driver to permit entry of a next stud into the bore for subsequent positioning by the positioning rod.

3,577,625
PROCESS AND MECHANISM FOR SETTING IGNITION DISTRIBUTOR CENTRIFUGAL ADVANCE
George M. Schiedel, Ypsilanti, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Mar. 27, 1969, Ser. No. 811,024
Int. Cl. F02p *17/00*
U.S. Cl. 29—407P **11 Claims**



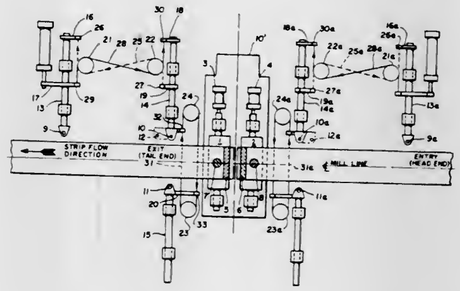
Tabs determining the amount of centrifugal advance are adjusted during distributor rotation at various speeds by applying appropriate hammer blows to a mechanism rotating with the distributor shaft assembly. The hammer blows are applied to concentric anvil members projecting from the top of the mechanism and are transmitted by members located within the mechanism to pins positioned adjacent the tabs. A photoelectric system senses the amount of advance at various rotating speeds and automatically controls the application of the hammer blows.

3,577,626
METHOD OF MAKING A TRIM MOLDING
Darl L. Link, Charlotte, Mich., assignor to Hoover Ball and Bearing Company, Saline, Mich.
Filed Feb. 6, 1969, Ser. No. 797,137
Int. Cl. B23p *9/00*
U.S. Cl. 29—445 **10 Claims**



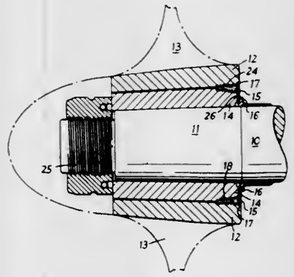
A method of manufacturing a trim molding having an anodized aluminum channel member in which is locked a vinyl bumper strip. The method includes the steps of extruding the aluminum in the form of an open channel with the bottom wall inclined upwardly from the sides to the center, inserting the vinyl strip into the open channel, and pressing down on the strip so that the bottom wall of the channel is flattened, causing the sides of the channel to close on the vinyl strip, thereby locking it in place in the channel. Appropriate buffing, anodizing of the aluminum, and cutting to length of the interlocked parts then follows. A product made according to the method is also disclosed.

3,577,627
METHOD AND APPARATUS FOR ALIGNING STRIP IN STRIP JOINING EQUIPMENT
Foster R. Woodward, Warren, Ohio, assignor to The Taylor-Winfield Corporation, Warren, Ohio
Filed Mar. 26, 1968, Ser. No. 716,116
Int. Cl. B23q *3/00*
U.S. Cl. 29—464 **10 Claims**



Method and apparatus for joining metal strip in general end-to-end relationship involving first aligning the strip lengths both transversely and angularly (to prevent dogleg) whereby the joint will be made so that the centerline of the strips will coincide with the longitudinal centerline of a machine. The control system includes, at each side of the joining means or welder, two sensors along one side of the strip which are interconnected by a sprocket and chain or equivalent means so that as one of the sensors follows the edge of the strip, the other will move correspondingly whereby both sensors will always be equidistant from the longitudinal centerline of the machine and one will control lateral movement of an auxiliary strip clamp to move the strip accordingly. A third sensor on the opposite side of the strip and of one of said sensor, and similarly linked thereto by a sprocket and chain or the like, is effective to control the main clamp to finally move the strip laterally so that its centerline will coincide with that of the machine. Similar controls are provided at the exit (tail end) and the entry (head end) of the machine. A fourth sensor control is optional to prevent the necessity of circuit switching.

3,577,628
MOUNTING OF PROPELLERS, IMPELLERS, WHEELS AND THE LIKE IN TORQUE AND THRUST TRANSMITTING CONNECTION ON SHAFTS
Thomas Walter Bunyan, London, England, assignor to P & O Pilgrim Valve Limited, London, England
Filed Feb. 27, 1969, Ser. No. 802,904
Claims priority, application Great Britain, Mar. 11, 1968, 11,816/68
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.1 **8 Claims**



A method of mounting a propeller, impeller, wheel or the like on a shaft with a separate metallic externally tapered

sleeve in torque and thrust transmitting connection on the shaft and force-fitted for torque and thrust transmitting connection in a correspondingly internally tapered hub of the member being mounted, in which a layer of a hardenable or cold-setting synthetic resin composition such as Araldite in liquid condition is introduced between the outer surface of the sleeve and the inner surface of the hub and the force-fitting pressure between the sleeve and hub maintained until the resin composition has set.

3,577,629

BONDING OXIDIZABLE METALS TO INSULATORS

George Wallis, Lexington, and John J. Dorsey, Waltham, Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

No drawing. Filed Oct. 18, 1968, Ser. No. 768,911

Int. Cl. B23k *31/02*

U.S. Cl. 29—472.9 **12 Claims**

An insulating member, such as a glass or fiber-optic, is bonded to a metallic member without excessive oxidation thereof by first heating the insulating member to a relatively low temperature and impressing a voltage across the members, causing an attraction between them which largely excludes atmospheric oxygen from the region to be bonded. The lowered resistivity of the insulator at this temperature also causes a low-density electric current to flow from one member to the other. The insulating member is then heated to a higher temperature while a voltage is maintained across the members, at which temperature a permanent bond is formed between the members in a relatively short time.

3,577,630

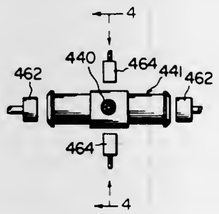
METHOD OF ATTACHING TRANSMISSION BELT AND PIN

Bernard S. Appleton, 926 Midway, Woodmere, N.Y.

Division of 699,970, Jan. 23, 1968, Pat. No. 3,479,893. Continuation-in-part of Ser. No. 566,960, July 21, 1966, Pat. No. 3,451,282. Application Sept. 4, 1969, Ser. No. 855,346

Int. Cl. B21d *39/00;* **B23p** *11/00*

U.S. Cl. 29—517 **3 Claims**



This invention relates to flexible transmission belts adapted for use with sprocket wheel means. The transmission belts comprise transmission pin means with, or without, rollers, held together serially by an elongated body construction such as cable made of wire, cord, fabric or other suitable material. The invention contemplates a method of attaching the pins to the belt or cable, or cables by providing a pin with an opening adapted to encircle the cable, greater in diameter than the diameter of the cable, and then applying pressure to the pin until the material of the pin flows into at least a portion of the clear space between the cable and the opening in the pin so that a mass of material of the pin will grip the cable securely.

3,577,631

PROCESS FOR FABRICATING INFRARED DETECTOR ARRAYS AND RESULTING ARTICLE OF MANUFACTURE

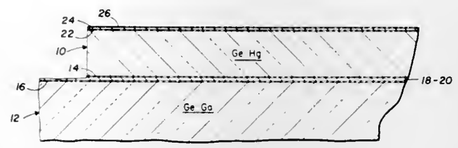
Ernest G. Bylander, and Hall E. Jarman, Dallas, Tex., assignors to Texas Instrument Incorporated, Dallas, Tex.

Filed May 16, 1967, Ser. No. 638,915

Int. Cl. B01j *17/00;* **H01c** *7/08*

U.S. Cl. 29—572 **22 Claims**

An infrared detector array is fabricated by alloying a slice of mercury doped germanium to a degenerate germanium substrate. After being lapped to the desired thickness, the slice is etched through to the substrate to form individual detector bars using a metal mask which is then partially removed to form a gold contact strip on each bar. Output conductors are formed by patterning copper films ther-



mocompression bonded to high temperature plastics, gold plating the conductors, and connecting the gold plated conductors to the gold contact strips by gold jumper wires thermocompression bonded to the conductors and to the contact strips.

3,577,632

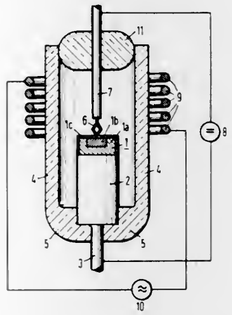
METHOD OF PRODUCING SEMICONDUCTOR DEVICE IN GLASS HOUSING

Ernst Hofmeister, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Continuation of application Ser. No. 635,919, May 3, 1967, now abandoned. This application Sept. 18, 1969, Ser. No. 859,596

Int. Cl. B01j *17/00;* **H01l** *7/20*

U.S. Cl. 29—585 **4 Claims**



An electrical conductor is extended through an open end of a glass housing into permanent electrical contact with a semiconductor body of a semiconductor device affixed to and supported by an electrically conductive support member. The open end of the housing is hermetically sealed by heating such open end. The support member passes through the opposite closed end of the housing. An electrical current is passed through the semiconductor device via the support member and the electrical conductor during the hermetic sealing of the open end of the housing.

3,577,633

METHOD OF MAKING A SEMICONDUCTOR DEVICE

Makoto Homma, Tokyo, and Toshiaki Saito, Kodaira-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of application Ser. No. 685,878, Nov. 27, 1967, now abandoned. This application Oct. 1, 1969, Ser. No. 864,288

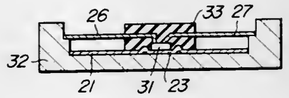
Claims priority, application Japan, Dec. 2, 1966, 41/78682

Int. Cl. B01j *17/00;* **H01l** *1/10*

U.S. Cl. 29—588 **8 Claims**

A method of assembly of a transistor, wherein a lead support member and pairs of collector lead molds are punched in advance in a tape-shaped metal sheet; a lead support member corresponding to said lead support member and

pairs of emitter-base lead molds are punched in another tape-shaped metal sheet; a collector electrode of a planar type transistor is put into contact with the center of said collector lead; the position of the end parts of the base and emitter leads with respect to the position of said collector lead is defined by piling up said two support members and thereby



the end parts of said two leads are put into contact with said base and emitter electrodes of the transistor; all of said leads and electrodes corresponding thereto are coupled mutually by soldering; said transistor part is molded with resin; and said leads are removed from said respective support members.

3,577,634

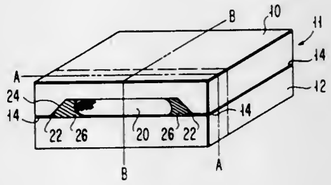
METHOD OF MANUFACTURING A MAGNETIC HEAD ASSEMBLY

Duane R. Secrist, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 18, 1969, Ser. No. 834,476

Int. Cl. H01f *7/06*

U.S. Cl. 29—603 **6 Claims**



A magnetic head slider assembly, used in disc storage files for air bearing noncontact recording is formed from three parts that enclose a glass-bonded ferrite core. During manufacture, a high temperature glass is used to form the nonmagnetic gap in the core, and a low temperature glass is disposed adjacent to the gap glass between the pole pieces of the core. When the core is positioned within a cavity of the slider, the core containing both glasses is heated sufficiently to cause only the low temperature glass to flow and fill the cavity, thereby bonding the core to an inner wall of the cavity within the slider assembly.

3,577,635

METHOD FOR ISOSTATIC COMPRESSION, SUCH AS THE MANUFACTURE OF POWDER BODIES

Carl Bergman, and Harry Claesson, Vasteras, Sweden, assignors to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

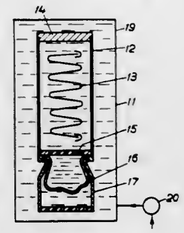
Filed Oct. 30, 1968, Ser. No. 771,966

Claims priority, application Sweden, Nov. 8, 1967, 15322/67

Int. Cl. H01c *15/04, 17/00*

U.S. Cl. 29—615 **4 Claims**

A body to be compressed is inserted within a flexible container containing a compression medium compatible with the body and the container is then placed within an outer com-



pression chamber containing another compression medium compatible with the container and chamber.

3,577,636

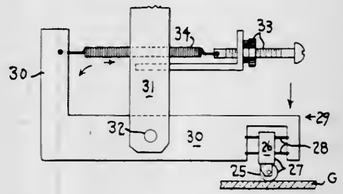
RESILIENT CUTTER

Robert P. Detorre, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of application Ser. No. 640,285, May 22, 1967, now abandoned. This application Jan. 7, 1969, Ser. No. 789,468

Int. Cl. B26b *3/00;* **B26d** *3/08*

U.S. Cl. 30—164.95 **2 Claims**



A scoring device with a resilient connection between a support and a scoring head to provide a uniform scoring pressure on a glass surface resulting in a uniform severing line.

3,577,637

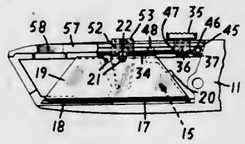
RETRACTABLE BLADE KNIFE

Paul A. Braginetz, Augusta County, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Sept. 24, 1968, Ser. No. 761,903

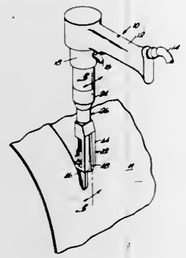
Int. Cl. B26b *3/08*

U.S. Cl. 30—162 **6 Claims**



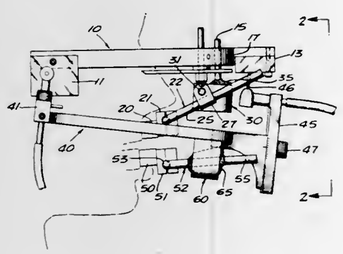
An industrial blade holder combination with the blade being mounted on a carrier and selectively movable to retracted and operative positions including a position in which the blade is readily removable for replacement, the combination including a blade magazine for replacement blades, the magazine being replaceably mounted in the handle and arranged to enable individual blades to be dispensed therefrom for insertion in the handle while the magazine remains in the handle.

3,577,638
CUTTING TOOL ATTACHMENT FOR A POWER HAMMER
Earl Chandler, 17211 N.W. 37th Ave., Opa-Locka, Fla.
Filed May 1, 1969, Ser. No. 821,044
Int. Cl. B26b *7/00*
U.S. Cl. 30—277 **6 Claims**



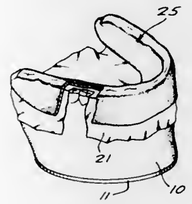
A powered panel cutter attachment for a power hammer having an impacter element and including a tubular housing removably attached to the impacter had having a reciprocable plunger oscillatable in a housing which terminates in a substantially C-shaped guide and support foot including a rear guide surface parallel to the path of reciprocation of the plunger and in spaced relation therefrom a T-shaped slot, and in which a tool element body includes opposed, parallel portions reciprocably and guidingly engaged by the respective parallel inner surface and T-shaped slot portions and is detachably connected to the plunger, and in which said tool body terminates in a lower metal-cutting means generally at the axis of reciprocation and below the foot of said housing; the metal-cutting means including on different attachments a cutting element for removing a relatively thin strip of metal, a chisel element and a spot-weld removing element.

3,577,639
FACE BOW WITH THREE-DIMENSIONALLY ADJUSTABLE SUPPORT MEANS
Robert L. Lee, Colton, Calif., assignor to said assignor to Gene W. Arant, Los Angeles, Calif.; said assignor to Juanita F. Arant, Los Angeles, Calif.; said assignor to Robert L. Lee, Los Angeles, Calif. and said assignor to Arlene M. Lee, Los Angeles, Calif., fraction part interest to each
Filed June 13, 1968, Ser. No. 736,613
Int. Cl. A61c *9/00*
U.S. Cl. 32—19 **15 Claims**



Jaw movement recording apparatus including an upper face bow supported from an upper clutch, and a lower face bow supported from a lower clutch. Each clutch carries a vise grip, and a U-shaped bolt or rod has its base or middle portion supported from the vise grip. The legs of each U-shaped bolt or rod project in a generally forward direction for supporting the associated face bow. Four adjustment members are used which are hollow, one being associated with each of these legs. After precise adjustment of the position of the face bow in three dimensions has been achieved, each of the hollow adjustment members is filled with quick-setting plaster to capture the then existing position of an associated rod end which projects into the cavity of the member.

3,577,640
DENTAL CLUTCHES, AND METHOD AND APPARATUS FOR MAKING
Robert L. Lee, 22937 Grand Terrace Road, Colton, Calif.
Filed Oct. 8, 1969, Ser. No. 864,742
Int. Cl. A61c *11/00*
U.S. Cl. 32—32 **3 Claims**

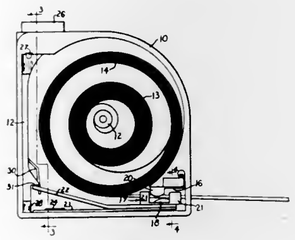


A dental clutch is disclosed consisting of a rigid tray made of a sheet of plastic material which is shaped to fit over and around the tooth structure of one jaw of a patient; and a preformed plastic stud block having a curved rear face and having a front flat face in which two laterally separated, parallel threaded openings are formed; the stud block being secured to the front vertical surface of the tray so that the threaded openings lie in a plane which is common to the tooth structure.

A method of aligning upper and lower clutches for a patient is also disclosed, in which the threaded openings of the two stud blocks are located in planes which are spaced apart but parallel to each other.

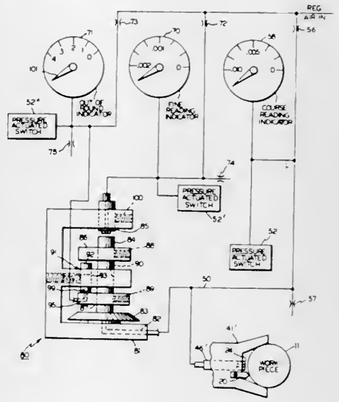
Also disclosed is an alignment fixture for supporting the stud blocks in their aligned relationship during attachment to the respective trays.

3,577,641
COMBINATION TAPE MEASURE AND COMPASS
Leedice Solomon Smith, Rte. 1, Box 132, Elk, Wash.
Filed Sept. 3, 1969, Ser. No. 854,953
Int. Cl. B43l *9/04*
U.S. Cl. 33—27 **9 Claims**



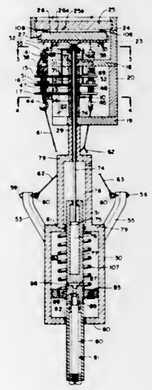
A coiled measuring tape is mounted within a case having an inner recess. A releasable locking clamp is located within the case recess for selectively fixing the tape relative to the case. It is operated by an external movable member that extends within the case for manually locking the tape and simultaneously causing a compass point fixed to it to protrude beyond the case. By use of the compass point, a circle can be scribed at the outer end of the tape. When released, the device permits the tape to be used for measuring purposes in the normal fashion.

3,577,642
IN-PROCESS WORKPIECE GAGING APPARATUS
Joseph V. Tripoli, 329 Troy-Del Way, Williamsville, and John J. Caligiuri, West Seneca, N.Y.
Filed Feb. 12, 1968, Ser. No. 704,726
Int. Cl. G01b *13/00*
U.S. Cl. 33—172 **6 Claims**



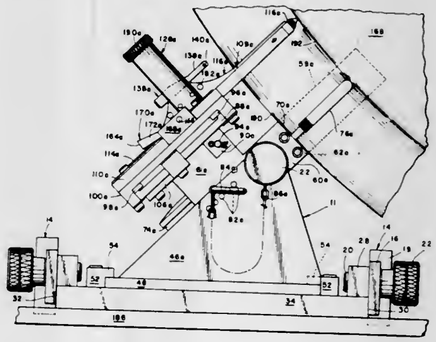
There is disclosed a system for gauging the dimensions of a machined surface of a workpiece being machined by a lathe or similar device, while it is being machined. To accomplish this, a machine tool having the cutting edge has affixed thereto a feeler gauge in such position as to encounter the workpiece in a region where it has just been machined. This gauge then moves with the cutting tool over the newly worked surface to give an indication of any variations from tolerance while the work is in process. A pneumatic gauge system is disclosed with particular feeler gauge structure to permit it to be used with various size parts.

3,577,643
BOREHOLE DEFORMATION GAGE
Thomas R. Schmidt, Lafayette, and Walter H. Husing, Walnut Creek, Calif., assignors to Shell Oil Company, New York, N.Y.
Filed May 18, 1967, Ser. No. 639,368
Int. Cl. E21b *47/08*
U.S. Cl. 33—178 **10 Claims**



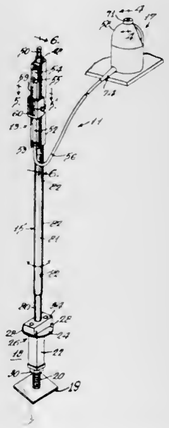
Internal stress of earth structure in situ may be determined by drilling a pilot hole and inserting a recording borehole deformation gage therein. Subsequently, the pilot hole including the recorder is recovered as a core by drilling out an annulus of the earth including the pilot hole. The borehole deformation gage is an optical interferometer instrument that is continuously monitored at short time intervals photographically.

3,577,644
WHEEL TREAD CONTOUR APPARATUS
Edward Ratcliffe, and William N. Crawford, Mont. St. Hilaire, Quebec, Canada, assignors to AMSTED Industries Incorporated, Chicago, Ill.
Filed July 26, 1968, Ser. No. 747,937
Int. Cl. B61k *9/12*
U.S. Cl. 33—203.11 **9 Claims**



A testing apparatus has indicators to measure the elevational distance between points on the periphery of wheels having treads and flanges and means to trace and reproduce peripheral section contours of said wheels. The measurements and reproductions may be used to determine wheel wear and high wear areas of the wheels.

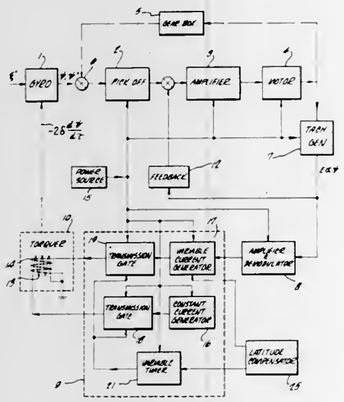
3,577,645
LEVELING APPARATUS FOR INSTALLATION OF RAISED FLOORS
Walter S. Zurawski, 7500 N. Elmhurst Road, Box 263, Bensenville, Ill.
Filed July 22, 1969, Ser. No. 843,624
Int. Cl. G01c *5/04*
U.S. Cl. 33—209 **10 Claims**



Apparatus for installing raised floors by means of adjusting leveling jacks, which apparatus includes a leveling head with a sight glass connected to a liquid reservoir, rotatable support shaft for the head having a base adapted for driving engage-

ment with a floor support jack and a rolling contact marker for scribing a level line for installing a drop ceiling.

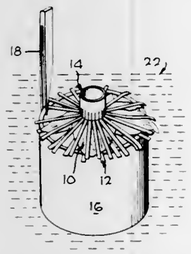
3,577,646
METHOD OF DAMPING DEVICES HAVING OSCILLATORY MOTION
Harry Nils Eklund, Pacific Palisades, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Nov. 30, 1967, Ser. No. 687,049
Int. Cl. G01c *19/38*
U.S. Cl. 33—226 **10 Claims**



A method for damping an oscillating mechanical system to bring it to rest at or near its equilibrium position employing iteratively a fixed damping cycle consisting of a first interval of undamped motion followed by a second interval of supercritically damped motion, the process being iterated a sufficient number of cycles to position the system as close as desired to the equilibrium position.

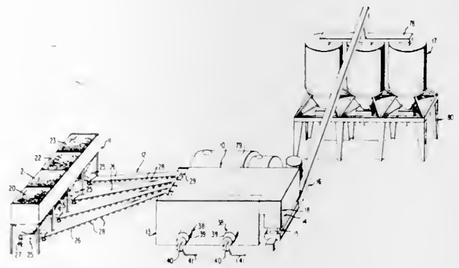
A preferred application of this method of damping is in connection with a meridian-seeking gyroscope, where the first interval of undamped motion consists of free precession of the gyroscope pin axle toward the meridional plane, followed by a second interval of supercritical damping that positions the spin axle closer to the meridional plane than at the release of the motion. By repeating the appropriately timed intervals of the cycle a number of times, the spin axle of the meridian-seeking gyroscope can be brought as close to the meridional plane as desired.

3,577,647
FLOWER-ENCAPSULATING APPARATUS AND METHOD
Mike S. Shimooka, P.O. Box 11184, Honolulu, Hawaii
Filed May 19, 1969, Ser. No. 825,753
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **11 Claims**



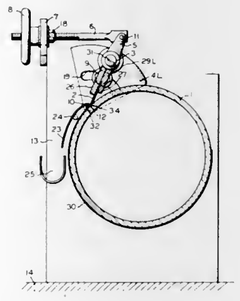
Apparatus and method for encapsulating flowers, particularly orchids, in plastic, comprising mounting a flower on a jig assembly that holds it in its natural-appearing shape, and sinking the assembly in an alcohol solution to dehydrate the flower so that it can be encapsulated in plastic.

3,577,648
BITUMINOUS MIXING METHOD AND APPARATUS
James D. Brock, Chattanooga, Tenn.
Filed Apr. 23, 1969, Ser. No. 827,448
Int. Cl. F26b *3/00*
U.S. Cl. 34—9 **11 Claims**



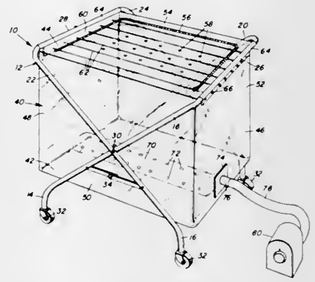
A mixing method and apparatus wherein rock aggregates of graded sizes are stored in separate storage bins and conveyed separately through a heating zone, simultaneously heated, and combined together in predetermined portions. A heated bituminous liquid is added to the combined aggregates in predetermined proportions, and the aggregates and bituminous liquid are mixed together to form a hot asphaltic composition.

3,577,649
DEVICE AND METHOD FOR CONTROLLING BULK DENSITY OF DEHYDRATED FOODSTUFFS
James I. Wadsworth; Alexander S. Gallo, Metairie; George M. Ziegler, Jr., Harahan, and James J. Spadaro, New Orleans, La.
Division of Ser. No. 690,536, Dec. 14, 1967, Pat. No. 3,494,050, Feb. 10, 1970, application Aug. 29, 1969, Ser. No. 872,795
Int. Cl. F26b *17/28*
U.S. Cl. 34—110 **1 Claim**



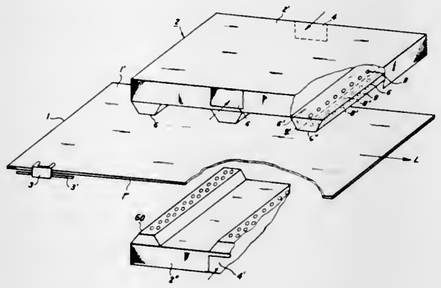
Bulk density of high-sugar-content dehydrated foodstuff is regulated by varying the thickness of the sheet of the said dehydrated foodstuff as it is being discharged from a drum dryer. The thickness of the said sheet is here varied upon varying the angle of attack of the doctor blade in respect to the drum surface of a drum dryer.

3,577,650
PORTABLE AND COLLAPSIBLE CLOTHES DRIER RECEPTACLE
Harry Brahm, P.O. Box 372, Riverside Station, Miami, Fla.
Filed Feb. 18, 1969, Ser. No. 800,073
Int. Cl. F26b *19/00*
U.S. Cl. 34—151 **4 Claims**



A portable and collapsible clothes drier receptacle mounted on a foldable frame and adapted for attachment to a heater-blower unit.

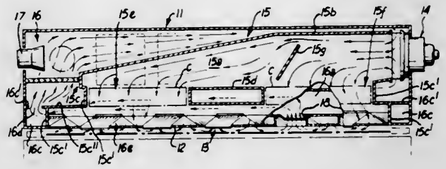
3,577,651
APPARATUS FOR AIR-TREATING SHEET MATERIAL SURFACES AND THE LIKE
John A. Nichols, Canton, Mass., assignor to Industrial Air Company, Inc., Shreveport, La.
Filed Dec. 5, 1968, Ser. No. 781,440
Int. Cl. F26b *13/02*
U.S. Cl. 34—155 **6 Claims**



This disclosure deals with the air-treating of sheet material surfaces and the like by introducing pressurized air upon the material through novel transversely extending and longitudinally spaced nozzle members provided with vertically separated perforated discharge members for providing substantially uniform air flow.

3,577,652
APPARATUS FOR THE DRYING OF SHEET MATERIAL
Raymond Victor Evans, Blackburn, and John Edward Hibbitt, Darwen, England, assignors to Singer-Cobble Limited, Blackburn, Lancashire, England
Filed Mar. 17, 1969, Ser. No. 807,855
Claims priority, application Great Britain, Mar. 18, 1968, 12970/68
Int. Cl. F26b *13/02*
U.S. Cl. 34—155 **14 Claims**

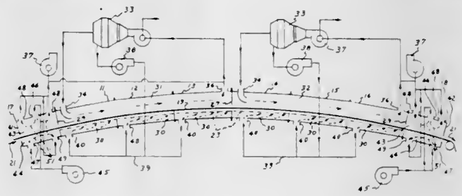
An apparatus for applying heated air to the surface of a sheet material has a dryer surface at an outer wall of a boxlike structure, the dryer surface being defined by alternate openings and apertured surface regions in the said outer wall, the apertured surface regions being connected together inwardly of the boxlike structure and being isolated from the openings, and a substantially closed air circulation system is developed by the apparatus when in use, air passing outwardly through the apertured surface regions and inwardly through the openings, or vice versa, during the surface treatment of a sheet material arranged in closely spaced



adjacent disposition relative to the dryer surface.

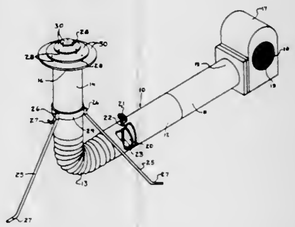
For simultaneous treatment of both surfaces of a sheet material two apparatuses as aforesaid will be used, such apparatuses being arranged in opposed closely spaced disposition with the material passing therebetween, and the air circulation systems of the individual apparatuses will be isolated one from the other to enable independent treatment conditions to exist at the opposite sides of the material.

3,577,653
WEB DRYING TUNNEL
John A. McClenathan, and Donald L. Nielsen, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.
Filed Jan. 20, 1970, Ser. No. 4,293
Int. Cl. F26b *13/00*
U.S. Cl. 34—156 **7 Claims**



An elongate moving web passing through a drying tunnel is supported along a slightly arched path by pressurized air directed against its concave lower face. The arched path of the web tends to prevent it from bowing transversely, thereby facilitating maintaining it in central relation to the tunnel by means of the air escaping upwardly around its edges. Additionally, the resulting profile of the web inherently reduces its tendency to wrinkle or sag, thus allowing it to be drawn through the tunnel under relatively low longitudinal tension.

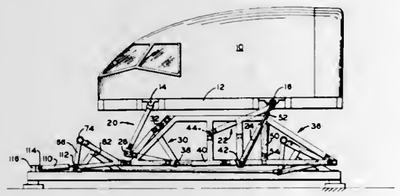
3,577,654
FORCED AIR DIFFUSER
James A. Marley, 801 W. Hudson St., Fayetteville, N.C.
Filed Aug. 13, 1969, Ser. No. 849,757
Int. Cl. F24f *13/06;* **F26b** *19/00*
U.S. Cl. 34—231 **3 Claims**



In abstract, a preferred embodiment of this invention is a portable air diffuser including an air duct network fitted at

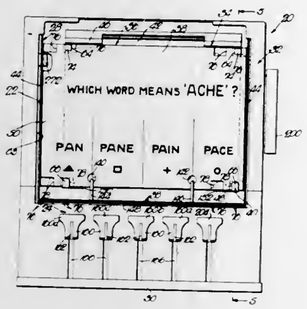
the intake extremity with a blower and having a series of baffles attached to the outflow extremity with intermediate dampening control means.

3,577,655
MOTION SIMULATOR
Edward G. Pancoe, Chenango Forks, N.Y., assignor to Singer-General Precision, Inc., Binghamton, N.Y.
Filed May 19, 1969, Ser. No. 825,652
Int. Cl. G09b *9/08;* **F16m** *11/32*
U.S. Cl. 35—12 **5 Claims**



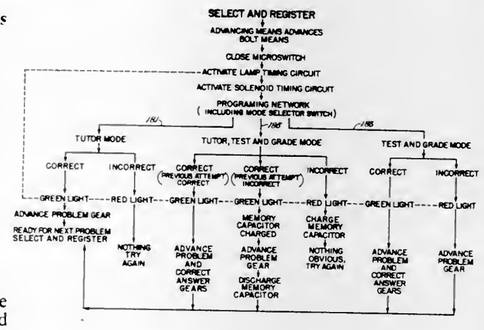
A motion system for a vehicle simulator, or the like, of the type wherein independent, extensible actuators are provided for moving the motion platform in each single axis of freedom relative to a fixed base. The present invention provides such a system with greatly improved excursion limits and simultaneous motion in more than one axis (by simultaneous movement of more than one actuator) by erecting the platform and linkage from a settled to a reference position through the use of an additional actuator which is not used for movement of the platform during operation of the system. The arrangement also allows actuator power to be turned off with the platform in a level, settled position without the use of gates or blocks normally required in motion systems of the independent type.

3,577,656
TEACHING APPARATUS
William H. Lyon, Woodbridge, Conn., assignor to KMS Industries, Inc., Ann Arbor, Mich.
Filed Apr. 21, 1969, Ser. No. 817,803
Int. Cl. G09b *3/06*
U.S. Cl. 35—9 **20 Claims**



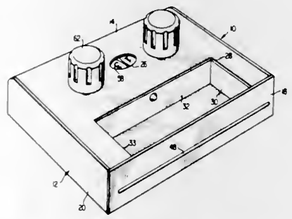
A teaching apparatus has a student-answer registering device including a number of individually manipulatable keys bearing different marks, with the device indicating a correct student answer on manipulation of any key the mark of which is in the order of the same key mark in a preassigned recurring sequence of successive manipulations of the keys, and the apparatus being adapted for use with successive cards or the like of which each card displays a problem question and as many answers thereto, including one correct one, as there are keys, with the answers on each card being marked the same as the keys, and the marks applied to the correct answers on successive cards conforming to the preassigned key mark sequence.

3,577,657
APPARATUS FOR PROGRAMED INSTRUCTION AND TESTING
George W. Plumly; Jack B. Hunnicutt, and Charles R. Deyo, Fort Worth, Tex., assignors to Edu-Tronics Corporation, Forth Worth, Tex.
Filed May 8, 1969, Ser. No. 823,058
Int. Cl. G09b *7/04*
U.S. Cl. 35—9 **19 Claims**



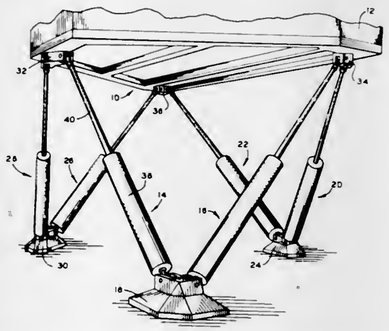
A programmable system for effecting automated teaching and including modes effecting testing and grading also, for use in conjunction with problem and answer material wherein a plurality of answers are provided for each problem arranged in accordance with a given program, characterized by an encoding means for conforming the system to the program, a problem display means for displaying the number of a given problem; a correct answer display means for displaying the number of correct answers selected and registered; advancing means selectively operable for advancing both the correct answer number display means and the problem number display means, only the problem number display means, or neither in accord with the mode selected and the correctness of the answer selected and registered; and apprising means for showing whether a selected and registered answer to a given problem is correct or incorrect. The encoding means includes a separable setting means, an answer selector means for selecting an answer to a given problem and a programming network that is programmed by the separable setting means to select the number of answers for each problem, the problem-correct answer sequence, the mode of operation and define whether or not an answer selected and registered is correct. Also disclosed are the mechanical and electronic details of each of the means, as well as embellishments of each of the means that facilitate use of the system.

3,577,658
TEACHING AID
Harold Weinstein, 1820 Avenue V, and Edward Snyder, III, 3323 Fillmore Ave., Brooklyn, N.Y.
Filed Aug. 11, 1969, Ser. No. 849,000
Int. Cl. G09b *7/00*
U.S. Cl. 35—9R **8 Claims**



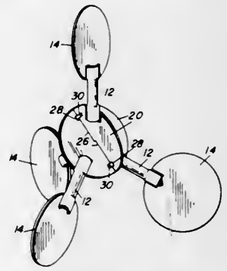
A teaching machine for use in self-instruction. A programmed card containing a problem and coded answer in the form of punched holes is inserted in the housing of the machine beneath a pair of wheels which are mounted in the housing for independent rotation and axial movement. The answer to the problem is selected by rotating the pair of wheels which have multiple indicia imprinted thereon which are selectively exposed to view during rotation. When the exposed indicia on each wheel are read together, they provide a proposed answer to the problem on the card. The wheels carry electrical contact elements about their circumference, and if the answer selected, as represented by the exposed indicia on each wheel, is correct, the contact elements will be positioned relative to the card so that when the wheels are moved axially towards the card the contact elements will pass through the punched holes to establish an electric circuit. A lamp in the circuit is then actuated to indicate that the correct answer to the problem has been selected. If the lamp is not actuated, then the answer selected is incorrect and the student can select another answer in an attempt to solve the problem.

3,577,659
MOTION SIMULATOR ACTUATOR JOINT
Karl Kail, Montrose, Pa., assignor to Singer-General Precision, Inc., Binghamton, N.Y.
Filed Aug. 6, 1969, Ser. No. 847,931
Int. Cl. G09b *9/08*
U.S. Cl. 35—12 **7 Claims**



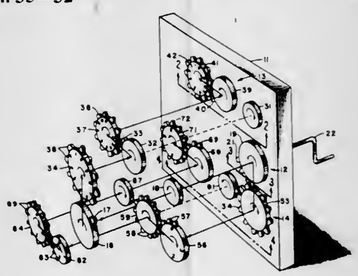
A three degree-of-freedom joint for attaching the upper end of a linear actuator to the motion platform of a six degree-of-freedom motion system. The disclosed configuration combines certain features of a ball-and-socket joint with a gimbal joint to achieve advantages and allow motion excursions not attainable with conventional joints previously used in such applications.

3,577,660
LINKAGE FOR MODEL-FORMING DISCS
Malcolm E. Kenney, 1203 Hereford Road, Cleveland Heights, Ohio
Filed Oct. 28, 1968, Ser. No. 771,121
Int. Cl. G09b *23/26*
U.S. Cl. 35—18 **1 Claim**



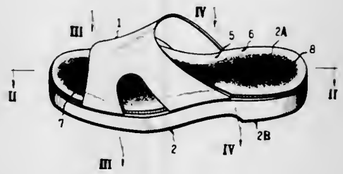
An apparatus for constructing molecular models having, as atom-representing members, both single discs and interengaged mutually perpendicular double discs and, as chemical bond-representing members, hollow tubes which are frictionally received over valence-representing recessed nibs on the discs.

3,577,661
TEACHING AID
Eldo Gene Usrey, 2052 Sunnybrook, Garland, Tex.
Filed July 16, 1969, Ser. No. 842,120
Int. Cl. G09b *19/02;* **G06c** *27/00*
U.S. Cl. 35—32 **6 Claims**



The present invention relates to apparatus for aid in the instruction of mathematics and, more particularly, it relates to apparatus for demonstrating counting systems to a base other than 10. In one form, the present invention may comprise a mechanical input means which functions to place arithmetical units of one into the system. In operative engagement with the unit input means is provided a variant base register means for registering the sum of units from the unit input means in a counting system having a base other than 10. In a preferred embodiment, a decimal register means is also provided in operative engagement with the unit input means for registering the sum of units from the unit input means in the decimal system for purposes of comparison of the totals in the decimal system with the totals in the variant base system.

3,577,662
FOOTWEAR
Tatsuo Fukuoka, No. 3, 3-Ban, 2-chome Shin-minami-Fukushima, Tokushima, Japan
Filed Jan. 14, 1970, Ser. No. 2,877
Int. Cl. A43b *3/12*
U.S. Cl. 36—11.5 **4 Claims**

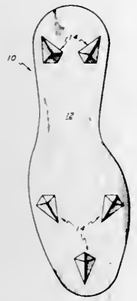


A sandal having a sole and a band member integrally molded from synthetic resinous material having a foamy interior and a nonfoamy exterior. The specific gravity of the sole is lower than the specific gravity of the band member.

3,577,663
ATHLETIC SHOE AND CLEAT
Howard Bruce Mershon, 14 Saint Lawrence Ave., Maplewood, N.J. 07040
Filed Aug. 11, 1969, Ser. No. 849,099
Int. Cl. A43c *15/00*
U.S. Cl. 36—67 **8 Claims**

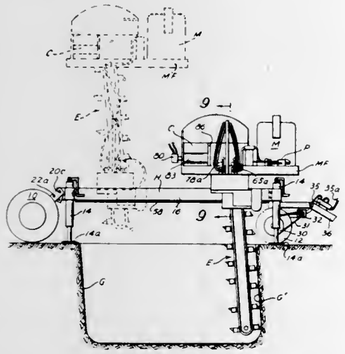
An athletic shoe and cleat wherein the exposed portion of the cleat is formed of a polyhedron forming at least two lines in a common plane, with one of the lines extending at a

greater angle with respect to the sole of the shoe than the other of the lines. A portion of the planes forming the polyhedron each have a vertex lying in a common point to



form an apex which is engaged by the ground, and the exposed portion of the cleat is manually movable with respect to the sole of the shoe to a plurality of angular positions.

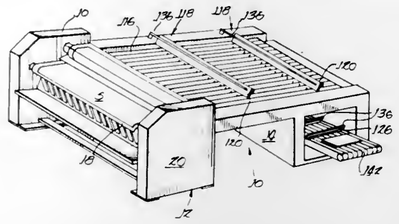
3,577,664
EXCAVATION MACHINE HAVING IMPROVED DIGGING ELEMENTS
T. J. Sing, and Reuben C. Sing, Pharr, Tex., assignors to Delta Diggers, Inc.
Filed July 22, 1968, Ser. No. 746,411
Int. Cl. E02f *3/14, 5/20*
U.S. Cl. 37—192 **6 Claims**



An excavation machine which is especially suitable for digging graves, wherein a mobile frame has an excavating assembly mounted thereon for movement substantially vertically and also horizontally relative to the frame for excavating the grave or other hole. The machine is compact, capable of being pulled on the highway, and is controlled hydraulically for the excavating operation. The excavation is effected with a plurality of scratching elements which scratch the dirt from the vertical wall and collect same in buckets on an endless conveyor, with such conveyor preferably being at a small angle with respect to vertical to obtain more effective, smooth excavating action so that the frame for the machine does not shift or move from its location during the excavating operation.

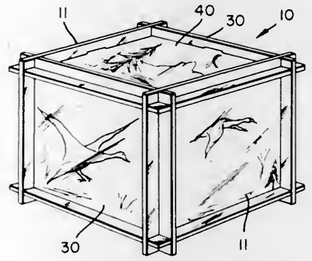
3,577,665
LAUNDRY APPARATUS
Eduard F. Kamberg, Deerfield, Ill., assignor to Chicago Dryer Company, Chicago, Ill.
Filed Sept. 8, 1969, Ser. No. 856,126
Int. Cl. D06f *61/08, 65/10, 69/02, 89/00*
U.S. Cl. 38—2 **5 Claims**

A finishing apparatus comprising a high-speed ironer cylinder and folder is provided which is adapted to process fabrics comprising polyester-cotton flatwork with a resin finish, polyester-cotton flatwork with no resin finish, as well as plain cotton flatwork. The provided apparatus includes a high-speed ironer cylinder having an extremely large portion



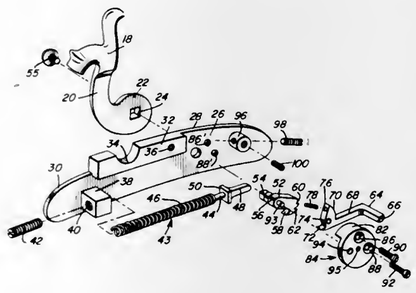
of the circumferential surface contacting flatwork to be ironed, and a folder portion arranged in series with said ironer and adapted to impart a plurality of transverse folds and cross-folds in the freshly ironed piece.

3,577,666
PICTURE HOLDER
Norman Wexler, 21218 Chase St., Canoga Park, Calif. 91304
Filed Dec. 15, 1969, Ser. No. 885,100
Int. Cl. G09f *1/12*
U.S. Cl. 40—152 **7 Claims**



A solid picture holder having an interlocked enclosed series of identical side panels with each alternate side panel being inverted, a pair of end panels attached to the top and bottom of the series of side panels, and a retainer within said side and end panels to hold pictures against their interior surface.

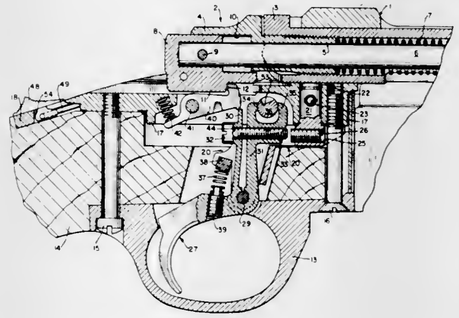
3,577,667
LOCK FOR PERCUSSION CAP RIFLE
Robert P. Kern, 319 E. Main St., Ligonier, Pa., and Allen J. Hamm, 251 McKimm Drive, Pittsburgh, Pa.
Filed Oct. 29, 1968, Ser. No. 771,411
Int. Cl. F41c *19/00*
U.S. Cl. 42—69 **5 Claims**



A gunlock having a hammer which pivotally mounts a ratchet member. A separate sear includes a pawl element

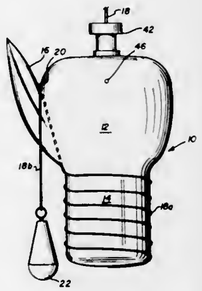
which engages the ratchet member upon cocking of the hammer. A coil spring device bears against the ratchet so that release of the sear by a trigger causes rapid rotation of the ratchet and commensurate striking of the hammer.

3,577,668
TRIGGER AND SAFETY ASSEMBLY FOR FIREARMS
William B. Ruger, Southport, Conn., and Leroy J. Sullivan, Huntington Beach, Calif., assignors to Sturm, Ruger & Co., Inc., Southport, Conn.
Filed July 22, 1969, Ser. No. 843,385
Int. Cl. F41c *17/02, 19/00*
U.S. Cl. 42—70E **9 Claims**



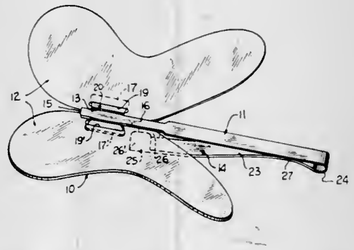
A trigger assembly and an anticreep safety mechanism therefor particularly for use in rifles and shotguns having a cartridge striker of the Mauser bolt action type. The trigger and safety assembly comprises a combination of elements which includes a trigger having a bifurcated trigger extension one leg of which releasably engages the sear of the striker and the other leg of which has a yoke that engages a rotatable safety element. When the rotatable safety element is rotated to the "safe" position the trigger and the bifurcated extension thereof are immovably positioned with respect to the sear, and rotation and withdrawal of the bolt is prevented.

3,577,669
FISHING BOBBER
Joseph A. Johnson, 12272 W. Mississippi Ave., Denver, Colo., and Ray Key, 4858 Meade, Denver, Colo.
Filed June 23, 1969, Ser. No. 835,519
Int. Cl. A01k *93/00*
U.S. Cl. 43—43.11 **4 Claims**



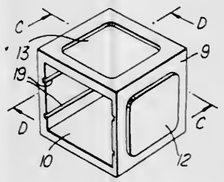
Fishing bobber of the type having a coiled supply of drop line with a terminal sinker adapted to descend after the bobber is delivered to a desired target point on the water, characterized by an inclined surface on the bobber which maintains the sinker attached to same until the bobber strikes the water, the buoyancy and attitude at which time permits a securing loop of drop line to slide off of the inclined surface; further characterized by a manually operable line clutch for adjusting the length of the drop line, the clutch also adapted to slip relative to the line during retrieval of a fish when the bobber engages the end of a fishing rod to thereby permit the drop line to be reeled in for landing the fish.

3,577,670
WING FLAPPING TOY
Peter Paul Gutierrez, 3101 Fresno St., Santa Clara, Calif.
Filed Feb. 19, 1969, Ser. No. 800,615
Int. Cl. A63h *11/00*
U.S. Cl. 46—1 **6 Claims**



A wing flapping toy simulating a creature of nature such as a butterfly and the like by a simple wing mount on a handle and gripping means on the latter for manipulating the wings in unison.

3,577,671
CONSTRUCTION KITS FOR TOYS AND MODELS
Roy Perry Woollett, Apsley Mead, Cocking, Midhurst, England
Filed Feb. 26, 1969, Ser. No. 802,550
Int. Cl. A63h *33/00*
U.S. Cl. 46—16 **14 Claims**

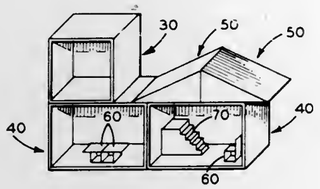


A construction kit for toys comprises a plurality of components for fitting together in various ways. One component is in the form of a hollow cube open on one, and only one face, having projections on some faces and recesses on the other faces, adapted for frictional interengagement. Half-cube components may be provided for sliding into said cubic components. Other components comprise a flat sheet with upstanding projections, and a flat sheet with recesses, adapted for engagement respectively with recesses and projections of cubic components: a like flat sheet with integral guide or rail means: and a like flat plate with legs extending perpendicular thereto.

3,577,672
MODULAR RIGID BLOCK-TYPE DOLLHOUSE CONSTRUCTION TOY
William Nutting, 15 Charles St., New York, N.Y.
Filed Sept. 1, 1967, Ser. No. 665,035
Int. Cl. A63h *33/06*
U.S. Cl. 46—19 **3 Claims**

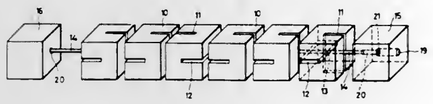
This disclosure is directed to a constructional toy and more specifically to a modular dollhouse construction toy comprising a plurality of rigidly constructed hollow blocks some of

which are open at least one side and adapted to be randomly arranged in unconnected, side-by-side and/or stacked relationship with respect to one another to simulate varying dollhouse floor plans. Simulated furniture and little people con-



structions are provided as accessory pieces. Wall surfaces are simulated by means of adhesive sheets to cover the inner and/or outer block surfaces, or two transparent telescoping blocks may receive one or more die cut sheets therebetween showing interior and exterior wall simulations.

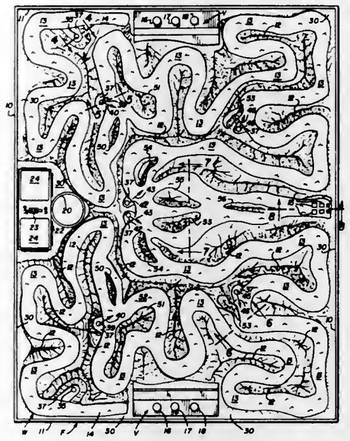
3,577,673
BLOCK ELEMENTS OF VARIABLE ANGULAR FORM
Ottorino Monestier, Via Abbondio Sangiorgio 12, Induno Olona, Italy
Filed Jan. 24, 1969, Ser. No. 793,787
Claims priority, application Italy, Jan. 31, 1968, 12245
Int. Cl. A63h *33/06*
U.S. Cl. 46—24 **2 Claims**



A dismemberable toy is disclosed, which comprises geometric solid elements, preferably cubic elements, having slotted faces defining a through-hole and adapted to afford a passageway for a threadlike resilient connection element to be fastened to the solids which form the ends of the assembly.

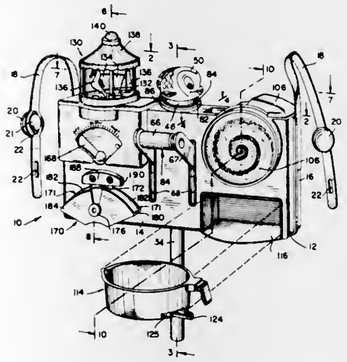
3,577,674
AMUSEMENT DEVICE
John Maguire, Littleton, Colo.; Tim M. Uyeda, South San Gabriel, Calif., and Theodore George Wahler, Denver, Colo., assignors to Samsonite Corporation, Denver, Colo.
Filed June 12, 1969, Ser. No. 832,585
Int. Cl. A63h *29/10*
U.S. Cl. 46—41 **10 Claims**

The amusement device is a water toy having a watercourse structure, vacuum formed from a plastic sheet to provide interleaved and interspaced ridges, with a pair of corresponding, circuitous channels therebetween and merging prior to a common drain. Islands also upstand from the channels. From a sump plate beneath, posts support the watercourse structure, while the watercourse structure and sump plate are also attached around their peripheral edges to an upright frame. The discharge from a battery-operated pump is carried by tubes to a pair of fluid control devices, from which tubes lead to nozzles extending upwardly through the watercourse structure. The nozzle outlets discharge in a direction to direct simulated boats away from impediments along and at corresponding positions in the channels. The connecting tubes are placed in the space between the watercourse structure and the sump plate. The fluid control devices are mounted on the sump plate and extend upwardly through the watercourse structure, while buttons thereon control diversion of



water to the respective nozzles, the normal flow of water being to a channel inlet end.

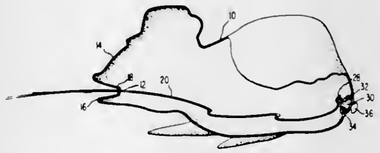
3,577,675
CHILD'S BATHING TOY
Frank Kohner, New York, N.Y., and Albert Stubbmann, Franklin Lakes, N.J., assignors to Kohner Bros., Inc., East Paterson, N.J.
Filed July 15, 1969, Ser. No. 841,872
Int. Cl. A63h *29/10*
U.S. Cl. 46—41 **18 Claims**



The bathing toy includes a casing to be located on the inside wall of a bathtub. The casing is supported by straps slung over the tub wall and fastened to the outside wall by suction cups. Mounted in the casing is a water pump, the nozzle of which can be rotated to direct a stream of water from the pump for activating selected water powered components. Bathtub water is drawn to the pump from an intake tube immersed below the bathtub water level. With the nozzle pointed in one direction, the water stream strikes a carousel, rotating the carousel figures. The water drains from the carousel to a teeter-totter bucket from which it is discharged into the bathtub. If the nozzle is pointed in another direction, the water stream actuates a turbine wheel and subsequently drains into a bucketlike container seated within the casing. The container includes a circular dish pivotally mounted on the bottom. The circular dish and the container bottom have a plurality of holes which are aligned when the dish is rotated

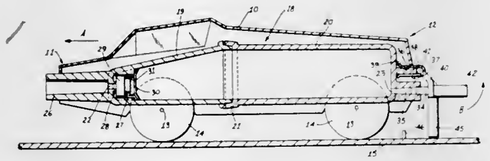
to a certain position. When the holes in the dish and the bucket bottom are in alignment and the bucket is lifted out of the container, the water flows from the bucket in tiny streams simulating a bathing shower. The pump is so constructed that it has a protracted discharge period after each actuating down stroke of its operating handle.

3,577,676
STRIP-PROJECTING SQUEEZE TOY
Truman W. Powell, 1146 St. Augustine Place N.E., Atlanta, Ga.
Filed Feb. 16, 1965, Ser. No. 433,004
Int. Cl. A63h *7/00*
U.S. Cl. 46—123 **14 Claims**



A squeeze toy wherein an elongated flexible element is disposed within a body having squeezable walls, the substantial length of the flexible element being projected from the body through an opening wherein upon the application of inward pressure to the walls causing a compression of air within the body which impinges the flexible element and carries the substantial length of it outwardly through the opening.

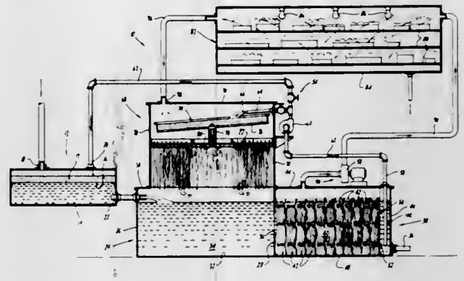
3,577,677
GRAVITY ACTUATED TOY VEHICLE HAVING AUXILIARY JET PROPULSION MEANS
Ambrose L. Bennett, Spotswood, and Sidney Tepper, Millburn, N.J., assignors to Topper Corporation
Filed Oct. 1, 1969, Ser. No. 862,662
Int. Cl. A63h *17/00*
U.S. Cl. 46—206 **10 Claims**



A toy wheeled vehicle carries a tank adapted to be filled with a pressurized fluid through an inlet provided with a one-way valve. A tank outlet at the rear of the vehicle is closed by a plug hinged to the vehicle. The plug carries an arm adapted to strike a projection located along the path of travel of the vehicle while the latter is moving under the influence of gravity. The plug is thereby removed from the outlet permitting a jet of fluid to issue from the outlet and give the vehicle a burst of forward thrust.

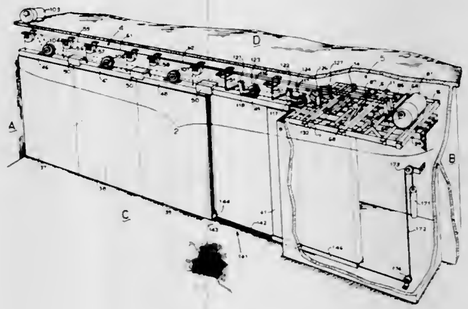
3,577,678
COMBINED WASTE TREATMENT AND GROWTH CHAMBER PROCESS
Robert Edward Burton, Willits, Calif., assignor to Microphor, Inc., Willits, Calif.
Filed Aug. 14, 1969, Ser. No. 850,178
Int. Cl. A01g *9/18;* **C02c** *1/02*
U.S. Cl. 47—58 **10 Claims**

A hermetically sealed combination of a liquid waste treatment system, of a type that utilizes aerobic microorganisms for consumption of waste and production of carbon dioxide as a byproduct, and a growth chamber, such as a conventional greenhouse, for the commercial growth of valuable plants which utilize carbon dioxide for photosynthesis. The



waste treatment system preferably includes a liquid body-containing bark strips to provide a convenient place for microbiological activity. A gas circulation system connects the air in the two components.

3,577,679
MULTIPLE AUTOMATICALLY RETRACTABLE AND EXTENSIBLE SLIDING DOORS IN PLANAR ALIGNMENT
Emil M. Petterborg, 1442 Wright Ave., Sunnyvale, Calif.
Filed May 18, 1970, Ser. No. 37,983
Int. Cl. E05d *13/02*
U.S. Cl. 49—127 **18 Claims**

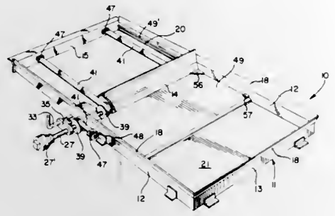


Presented is a sliding door structure for wide openings or for use as a partition to divide a large room into separate rooms and which utilizes separate door panels arranged in close juxtaposition while stored and which are moved individually from storage and placed in edge-to-edge planar alignment to close an opening when extended.

3,577,680
CLOSURE-GATE-ACTUATING MECHANISMS FOR HOPPER DISCHARGE ARRANGEMENT
Ernest J. Nagy, Munster, Ind., assignor to Pullman Incorporated, Chicago, Ill.
Filed Feb. 24, 1969, Ser. No. 801,631
Int. Cl. E05f *11/04;* **B61d** *7/20*
U.S. Cl. 49—358 **5 Claims**

A hopper discharge outlet arrangement including a frame and a closure member slidingly movable horizontally relative to a hopper discharge opening, the closure member being moved by the rotation of an operating rod having reels connected thereto on which flexible members are wound and un-

wound and are so anchored and positioned on the frame that in response to the direction of rotation the closure member is

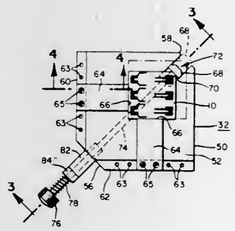


moved between open and closed positions with respect to said opening.

3,577,681
SAND BLASTING EQUIPMENT
Norman E. Waag, 3110 Broadview Road, Cleveland, Ohio
Filed Dec. 11, 1968, Ser. No. 782,854
Int. Cl. B24c *3/06*
U.S. Cl. 51—8 **1 Claim**

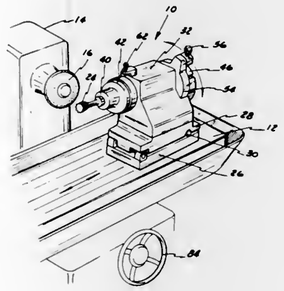
A sand aspirator probe for a portable sandblasting apparatus having two parallel tubes of unequal length and welded together along their axes and incorporating therein a sand-air mixing aspirator port in the proximity of the bottom ends of said tubes.

3,577,682
ABRADING APPARATUS
Walter Kulischenko, East Brunswick, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.
Filed June 2, 1969, Ser. No. 829,271
Int. Cl. B24b *41/06*
U.S. Cl. 51—8 **1 Claim**



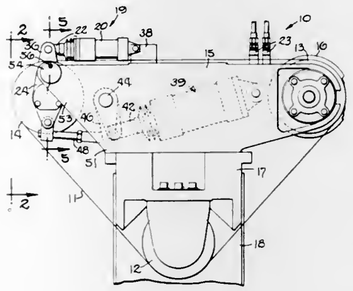
Abrading apparatus is provided with an improved workpiece holder including a plate on which is mounted structure having diverging edge portions and a spring-biased member for clamping the workpiece therebetween.

3,577,683
INVOLUTE GENERATING APPARATUS
Joseph Silvagi, Warren, and John W. Conforti, Detroit, Mich., assignors to Camdale Enterprises, Roseville, Mich.; Joseph Silvagi, fractional part interest to each and John W. Conforti, fractional part interest to each
Filed Aug. 15, 1968, Ser. No. 752,845
Int. Cl. B24b *3/00, 47/02*
U.S. Cl. 51—94 **9 Claims**



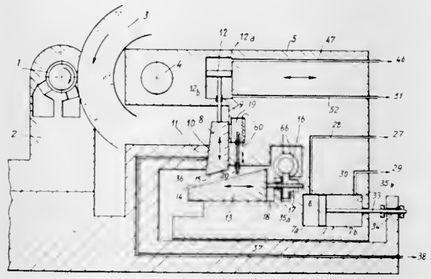
A fixture is disclosed for grinding involute teeth profiles in a gear blank. Each tooth is generated by reciprocating the gear blank tangentially with respect to the grinding edge of a rotating wheel while oscillating the blank about its axis as the axis is constrained to move in a plane that is parallel to the axis of the grinding wheel.

3,577,684
ABRADING MACHINE WITH STEERING ROLL AND TENSIONED ABRADING BELT
Zigmant Jakimcius, Rockford, Ill., assignor to Barnes Drill Co., Rockford, Ill.
Filed Dec. 30, 1968, Ser. No. 787,656
Int. Cl. B24b *21/18*
U.S. Cl. 51—135 **8 Claims**



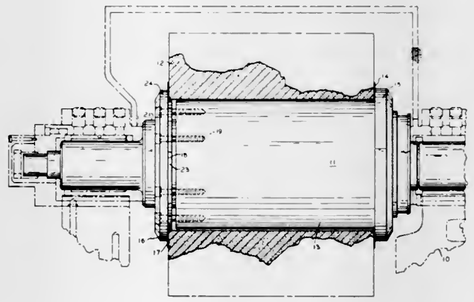
An endless belt abrading machine with a combined steering and tensioning roll which is mounted for up and down tilting movement and which is tilted alternately by oppositely inclined positions by a steering actuator so as to induce edgewise travel of the belt across the roll. The roll also is mounted for swinging toward and away from a second roll for driving the belt and is urged continuously away from the driving roll by a tensioning actuator to tension the belt and keep the latter taut on the rolls as the belt stretches during service use.

3,577,685
GRINDING MACHINE WITH A FEED CONTROL DEVICE
Louis Corbex, and Roger Burdet, Annecy, France, assignors to Societe Nouvelle De Roulements, Annecy (Haute-Savoie), France
Filed Apr. 10, 1968, Ser. No. 720,086
Claims priority, application France, June 13, 1967, 110151
Int. Cl. B24b *49/00*
U.S. Cl. 51—165 **8 Claims**



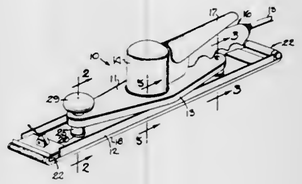
The device comprises the combination of two movable wedge members having each a moderately inclined plane, said wedge members being displaceable in two directions substantially at right angles to each other, the first wedge member abutting at the end of the approach stroke of the grinding wheel against a fixed stop of the frame structure of the machine, the second wedge member determining the end position of the first one, electric means for detecting the end position of the first wedge member in relation to the other one and controlling the finishing and planishing operations performed on the workpiece, by controlling the relative positions of the wedge members.

3,577,686
MOUNTING FOR A GRINDING WHEEL
Robert C. Fisher, Milford, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio
Filed June 13, 1969, Ser. No. 833,005
Int. Cl. B24b *41/00*
U.S. Cl. 51—168 **7 Claims**



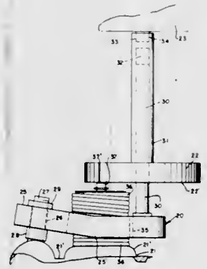
A removable flange for supporting one end of a grinding wheel. The flange is provided with wedge blocks which are held away from the spindle to allow radial positioning of the flange with respect to the spindle in accordance with the alignment of the wheel. The blocks are then released and radially lock the flange with respect to the spindle.

3,577,687
RUBBING MACHINE WITH THRUST-TRANSMITTING MEMBERS
Roy J. Champayne, c/o National-Detroit, Inc., 2810 Aulwin St., Rockford, Ill.
Filed May 29, 1969, Ser. No. 828,857
Int. Cl. B24b *23/00*
U.S. Cl. 51—170 **12 Claims**



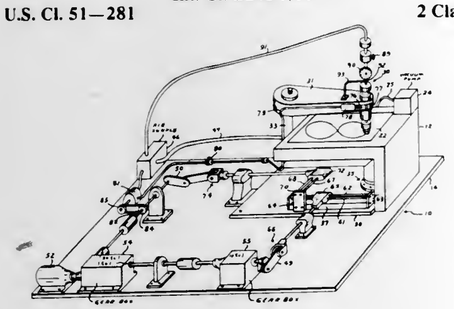
A rubbing machine of the type in which a support is spaced from and overlies a rubbing shoe and in which the rubbing shoe is connected to the support by a drive mechanism operable to gyrate the shoe. The rubbing shoe is rectangular in shape with the drive mechanism connected at the center of the shoe, and two flexible boots are connected between the support and the shoe on diametrically opposite sides of the drive mechanism. In the preferred embodiment, two pair of opposed, rigid studs are mounted between the support and the shoe to transmit thrust therebetween, and each pair of studs is mounted within a respective one of the boots with one of the studs connected to the support and one to the shoe. The opposed ends of the studs are smooth and positioned face-to-face so that the studs may slide on one another and still transmit thrust as the shoe gyrates.

3,577,688
VALVE STEM GRINDER ATTACHMENT
Orville A. Brenden, 1625 Fifth Ave. South, Fargo, N. Dak.
Filed Sept. 26, 1968, Ser. No. 762,942
Int. Cl. B24b *19/00*
U.S. Cl. 51—241 **2 Claims**



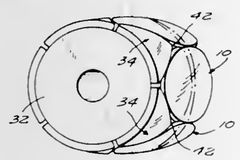
The invention comprises an aligner for grinding valve stems having an elongated plate member with a laterally extending shaft mounted at one end and with the plate having a bore at its other end, said plate has an open area intermediate its length to receive the upper end of the valve stem and valve spring therebetween, said bore at the other end of said plate being adapted to receive the mounting stud of the rocker arm of an engine head and to be locked thereto by a nut threaded onto said stud, said shaft being adapted to receive the hollow shaft of a grinder wheel to allow the grinder wheel to be lowered on to the upper end of the valve stem perpendicular to its length to grind the upper end of the valve stem.

3,577,689
METHOD FOR POLISHING METALLOGRAPHIC SPECIMENS
William F. Stuhrke, and Charles R. Underwood, Dayton, Ohio
Division of Ser. No. 730,831, May 21, 1968, filed Dec. 19, 1969, Ser. No. 889,863
Int. Cl. B24b *1/00*
U.S. Cl. 51—281 **2 Claims**



A metallographic specimen is moved in a figure-of-eight motion over a stiff paper supported by a hard backing surface on which the polishing compound is positioned at the crossover point of the figure-of-eight motion. The specimen is rotated about its axis after each predetermined number of motions. Apparatus is provided to give a continuous range of selectable pressures between the specimen and paper.

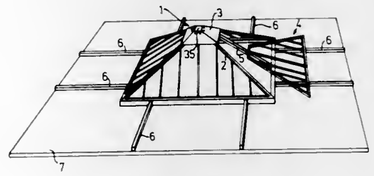
3,577,690
METHOD OF MAKING ONE-PIECE MULTIFOCAL LENS BLANKS
William M. Catron, 6900 Northwest 6th Court, Plantation, Fla.
Division of Ser. No. 688,454, Dec. 6, 1967, filed Aug. 4, 1969, Ser. No. 861,533
Int. Cl. B24b *1/00*
U.S. Cl. 51—284 **2 Claims**



The method of manufacturing a multifocal lens blank which may finally be processed into a prescription lens having reading and distance portions separated by a shoulder extending the width of the lens, wherein a plurality of optical glass workpieces, specially shaped for efficient further processing, are blocked about the circumferential edge of a blocking wheel and auxiliary slabs of optical glass are provided in the spaces between adjacent pieces. During the grinding and polishing operations, which are performed on the workpieces to transform them to lens blanks, the auxiliary slabs provide the additional support needed by the processing tools to form relatively undistorted lens surfaces.

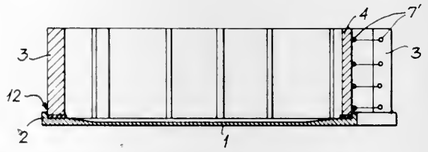
3,577,691
MOVABLE ROOF WINDOW HAVING A PYRAMIDAL FRAME CONSTRUCTION
Per Anders Persson, and Bror Lennart Sodersten, Stockholm, Sweden, assignors to Ruth L. Kallin, Uttran, Sweden
Filed Apr. 28, 1969, Ser. No. 819,638
Claims priority, application Sweden, June 17, 1968, 8186/68
Int. Cl. E04b *7/16;* **E04d** *13/035*
U.S. Cl. 52—72 **10 Claims**

A roof window includes support beams forming a pyramidal frame structure having an upper top roof and individually movable parallel trapezium-shaped roof or window sections. Each section can be moved between an open and a closed position, an upper guide extending between the base of a side of the pyramid and the top roof and a lower guide projecting outwardly from the said base being provided so as to cooperate with the upper and bottom portions, respectively, of the section. The guides form an angle with each other so that the section performs a combined displacing and swinging movement between its open and closed positions. Seals are provided between the sections and the frame structure. The lower guide is mounted or capable of being mounted on the roof of a building structure supporting the frame structure. The drive for the section may include a wire,



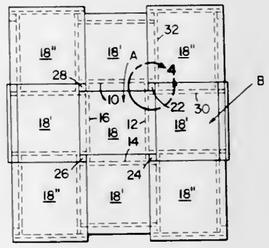
a chain or the like extending along the upper guide and connected with the upper portion of the sections and passing over end wheels arranged at the base of the frame structure or in the top roof. At least one of the wheels and preferably the one in the top roof is actuated by a drive motor. The seal includes sealing strips which extend along the side edges of the sections and cooperate with corresponding strips jutting from adjacent sections, said strips being of such configuration that, when the sections are in closed position, they present both an upper and a lower contact line with an insulating space therebetween. In the top roof is arranged a ventilation line provided with a fan which prevents misting or condensation in the region beneath the top roof when the sections are in closed position.

3,577,692
TANK STRUCTURE AND METHOD OF ERECTING SAME
Oscar Sircovich, Harbaron Hirsch 9, Jerusalem, Israel
Filed July 15, 1968, Ser. No. 744,928
Claims priority, application Israel, Dec. 25, 1967, 29212
Int. Cl. E04c *3/10;* **E04b** *1/14;* **E04g** *11/04*
U.S. Cl. 52—224 **10 Claims**



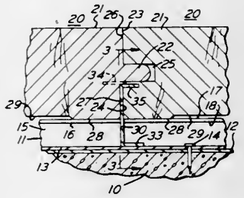
A concrete tank structure comprises a bottom slab, a plurality of inner and outer vertical columns arranged in circular arrays with each inner column spaced between and tied to a pair of outer columns, a plurality of wall panels each spanning one of the inner and one of the outer columns, and restraining means, preferably two or more cables, applied around all the outer columns for restraining their outward movement. According to a preferred method of erecting the tank and for introducing prestressing forces, a temporary structure is provided at the center and pulls inwardly on the inner columns before the restraining cables are applied to the outer columns.

3,577,693
CELLULAR BUILDING STRUCTURE
Uri Y. Sofer, Berkeley, and Irwin L. Kaltman, El Cerrito, Calif., assignors to Technology Consortium, Inc., Berkeley, Calif.
Filed Dec. 9, 1968, Ser. No. 782,215
Int. Cl. E04h *1/38, 1/04*
U.S. Cl. 52—236 **10 Claims**



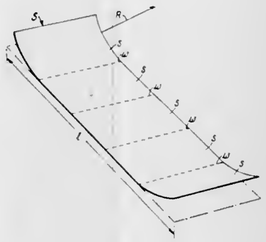
A building system containing a plurality of room-sized rectangular cells formed of panels and upright corner posts, each corner post providing vertical support for respective ends of up to four panels. The system possesses flexibility for expansion as well as versatility of design at low cost to the builder.

3,577,694
FLOORING SYSTEMS
Ray E. Omholt, Berwyn, Pa., assignor to Powerlock Floors, Inc., Philadelphia, Pa.
Continuation-in-part of application Ser. No. 534,371, Mar. 19, 1969, now abandoned, Continuation-in-part of application Ser. No. 724,799, Apr. 29, 1968, now abandoned. This application Aug. 18, 1969, Ser. No. 850,989
Int. Cl. E04b *5/00*
U.S. Cl. 52—483 **9 Claims**



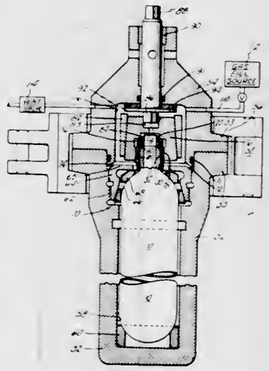
A flooring system utilizing standard pattern conventional tongue and groove wood floorboards, the boards being supported on transversely disposed spaced channels, metallic holding clips securing the boards in bearing engagement with the channels, the boards being free from any special slots for clip engagement, the clips engaging the boards in a driven penetrating relation below the tongues and grooves in a manner which does not interfere with the tight vertical engagement of the tongues and grooves nor cause splitting of the boards, the clips engaging the channels each having a body portion vertically disposed between the boards below the tongues and grooves and having at the upper margin of the body portion a horizontally extending toothed portion driven in fiber-penetrating engagement into the board along the edge at locations wholly below the lower margin of the tongue on the tongue side of the board, and optionally, for greatly increased holding power having a penetrating portion extending into the groove side of the board below the groove.

3,577,695
CONSTRUCTION OF HEATERS
Heinz W. Huybers, Ashtead, Surrey, England, assignor to Foster Wheeler Corporation
Filed Mar. 18, 1969, Ser. No. 808,279
Int. Cl. E04b *1/35*
U.S. Cl. 52—745 **6 Claims**



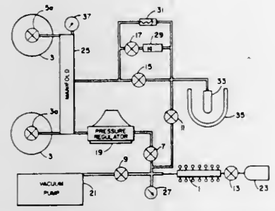
This invention describes the construction of heaters in which chemical process streams are heated by making a composite sheet having the developed length of the cylindrical heater. The composite sheet is then rolled up rather like a "Swiss roll" to a size suitable for transport. Then on site the composite sheet is unrolled to a cylindrical shape to form one cylindrical section of the heater, the latter being formed by stacking a number of such sections one upon another.

3,577,696
METHOD OF FILLING A PRESSURE VESSEL ASSEMBLY
Herbert G. Bock, Farmington, and Walter J. Szerejko, Newington, Conn., assignors to Chandler Evans Inc., West Hartford, Conn.
Division of Ser. No. 758,904, Sept. 10, 1968, filed Apr. 29, 1969, Ser. No. 856,226
Int. Cl. B65b *31/02*
U.S. Cl. 53—7 **3 Claims**



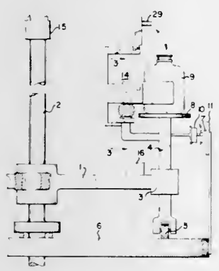
A metal high-pressure gas storage vessel has a threaded neck adapted to engage a threaded cap such that both cap and neck sealingly bear against an interposed seal element. The seal and cap are loosely assembled with the empty bottle and placed in a fluidtight filling fixture whereupon highly pressurized gas is introduced to the fixture, causing the bottle to fill by leakage between the loosely engaged threads. Then the cap is tightened and the fixture is vented prior to removal of the filled bottle. To lock the cap against rotation, the cap is locally upset into grooves in the neck after the acceptability of the charge has been verified.

3,577,697
HIGH-PRESSURE GAS-FILLING APPARATUS AND METHOD
Teddy J. Peacher, Huntsville, Ala., assignor to the United States of America as represented by the Secretary of the Army
Filed July 1, 1969, Ser. No. 838,117
Int. Cl. B65b *31/00*
U.S. Cl. 53—12 **4 Claims**



A high-pressure gas-filling apparatus and method for filling gas containers such as lamps to a positive pressure of several atmospheres to minimize waste of supply gas. Empty lamp bodies are attached to a filling manifold and the filling apparatus is evacuated to a desired pressure range before filling occurs. After the lamps have been filled and sealed, control valves are closed to trap unused supply gas in the system. The trapped gas is then liquified and collected in a freezeout chamber by applying cooling to the freezeout chamber. When cooling is discontinued, the liquified gas in the chamber revaporizes and when sufficient pressure builds up, the gas reenters the high-pressure supply side of the apparatus for reuse. Through the use of the freezeout chamber one of the supply containers can be purged, when its pressure will not operate a regulator, and the residual gas therein be placed into the other supply container.

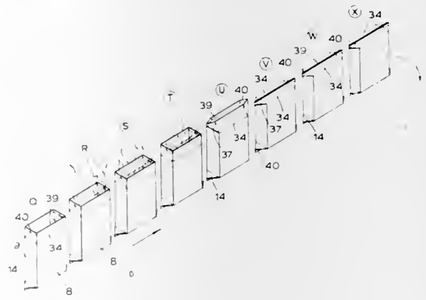
3,577,698
METHOD AND MEANS FOR FILLING AND SEALING A FLEXIBLE CONTAINER
Herbert S. Ruekberg, Highland Park, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed June 11, 1968, Ser. No. 736,139
Int. Cl. B65b *3/04*
U.S. Cl. 53—37 **10 Claims**



A means and process for filling a plastic bottle with a premeasured amount of liquid, squeezing the plastic bottle until the level of liquid in the bottle comes to a predetermined height and then capping and sealing the bottle.

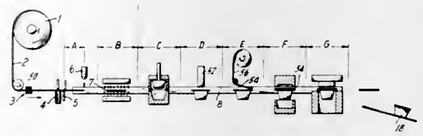
3,577,699
METHOD OF CARTONING
Stanley Milton Silver, 10 Blenheim Street, London, W. 1, England
Filed Sept. 4, 1969, Ser. No. 855,283
Claims priority, application Great Britain, Sept. 17, 1968, 44074/68
Int. Cl. B65b *11/58;* **B31b** *7/60, 49/02*
U.S. Cl. 53—27 **8 Claims**

A package is described wherein the contents are hermetically sealed in an inner lining of moisture resistant flexible sheeting material, which is wholly contained in a closed and sealed container of a substantially rigid material, such as boxboard, and yet the flexible sheeting initially constituted a layer sealed over the entire area of the board by means of a thermoplastic coating such as a microcrystalline wax. The lining remains sealed over a substantial area of the board after completion of the package. The package is rectangular and formed from a single unitary blank, the ends of the container being closed by flaps that have been severed from one another and, over the major portion of their area, detached



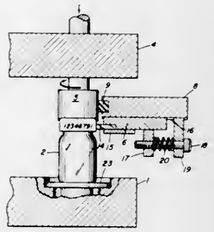
from the inner lining by the heating of the thermoplastic coating which is then absorbed in the boxboard material. The inner lining is sealed at each end by means of fin seals with web-gusseted ends. These are created by inwardly folding the ends of the container before the flaps are severed from one another, this initial folding involving gusset folding and the subsequent folding, after the severance of the flaps, being that of ordinary dust flaps and cover flaps. The fin seals are heat sealed when the heat is applied to strip the neighboring boxboard from the flexible material.

3,577,700
METHOD AND APPARATUS FOR PRODUCING CONTAINER PARTS FROM SHEET MATERIAL
Walter Bippus, Bensheim, and Horst Ackermann, Wiesbaden, Germany, assignors to Demag A.G., Duisburg, Germany
Filed Nov. 20, 1969, Ser. No. 878,282
Claims priority, application Germany, Dec. 20, 1968, P 18 15 983.6
Int. Cl. B65b *41/04, 47/10*
U.S. Cl. 53—30 **7 Claims**



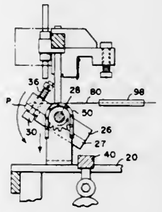
A method for the mechanical production of containers and container bottom parts includes the feeding out of a sheet of a material which is thermoplastically deformable and the indexing of the sheet past cutting, heating or molding, filling, covering and sealing apparatus to effect the deep drawing and filling and sealing of the container. The material is fed out and cut into a predetermined length from a web of such material and the individual cut portions are provided with raster holes by means by which the cut elements are centered in respect to the subsequent operations thereon. The apparatus for carrying out the method includes a conveyor having finger elements which are movable to engage in the raster holes of the individual cut elements and to move them to each additional working station and to center them at each station. The web material from which the molded containers are formed advantageously includes a printed distorted picture thereon for facilitating the centering and cutting thereon.

3,577,701
PRINTING AND CRIMPING ALUMINUM SEAL CLOSURES
George Spencer Bott, Westwood, N.J., and William Henry Marlow, Pearl River, N.Y., assignors to American Cyanamid Company, Stamford, Conn.
Filed Oct. 31, 1968, Ser. No. 772,096
Int. Cl. B65b *61/26;* **B67b** *5/04*
U.S. Cl. 53—131 **5 Claims**



A process and apparatus for printing indicia by indentation on vial or bottle seal closures made of soft stock, such as aluminum. The marking is impressed on the closure while it is capped over a glass vial or bottle held in position with resilient chucks which turn the bottle, and thereafter while the bottles are still being turned the closure is crimped under the flange or shoulder of the bottle by rotating against a crimping or curling bar. The indicia may be letters or numbers.

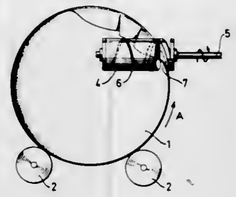
3,577,702
BANDING MACHINE
Frederick Bescript, Cherry Hill, N.J., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.
Filed Jan. 13, 1969, Ser. No. 790,587
Int. Cl. B65b *13/02*
U.S. Cl. 53—198 **10 Claims**



A banding machine wherein a strip of banding material is fed onto an article supported at a banding station. The article and the strip of banding material are gripped together and then given a revolving motion to cause the banding material to be wrapped completely around the articles. The wrapped portion of the banding material is then secured together in a wrapped condition by a heat sealing operation and served from the supply strip.

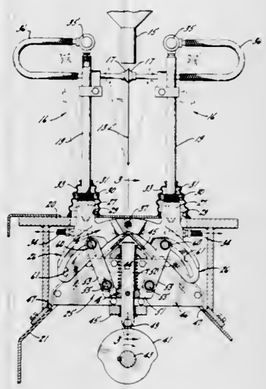
3,577,703
MEANS FOR FOLDING IN WRAPPING MATERIAL AT THE END OF AN APPROXIMATELY CYLINDRICAL ARTICLE
Karl Gustav Kohler, Folkungavagen, Sweden, assignor to Aktiebolaget Nordstroms Libanor, Stockholm K., Sweden
Filed Feb. 12, 1969, Ser. No. 798,620
Int. Cl. B65b *49/12*
U.S. Cl. 53—380 **3 Claims**

The invention is concerned with wrapping of a cylindrical article, such as a roll, for example a paper roll. Hence particularly, the invention relates to folding the end of the wrapping while rotating the wrapped cylinder. According to the invention there is provided a rotatable folding body having a helical groove or land surface extending around the periphery of said body and during the rotation of said folding body, abutting the wrapping material at the end of said



wrapped cylinder so as to fold in said material at said end substantially continuously. The helical groove or land surface may have a varying pitch and/or width, for example decreasing towards one end of the folding body.

3,577,704
PIVOT ASSEMBLY FOR MOUNTING SWINGABLE OPERATING MECHANISMS OF A PACKAGING MACHINE
Robert F. Lense, Rockford, Ill., assignor to Riegel Paper Corporation, New York, N.Y.
Filed Sept. 19, 1969, Ser. No. 859,306
Int. Cl. B65b *43/30*
U.S. Cl. 53—386 **5 Claims**

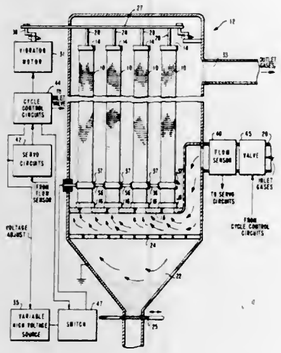


The bag openers of a packaging machine are mounted for in and out swinging relative to the bag path by a pivot assembly which may be adjusted quickly and easily to change the length of the swinging stroke of each opener independently of the stroke length of the other opener and without changing the home positions to which the openers swing at the inner ends of their strokes.

3,577,705
FILTER SYSTEM
Ian B. Sharlit, Los Angeles, Calif., assignor to Hitco
Continuation-in-part of application Ser. No. 627,914, Apr. 3, 1967, now abandoned. This application Dec. 23, 1968, Ser. No. 805,065
Int. Cl. B03c *3/36*
U.S. Cl. 55—4 **19 Claims**

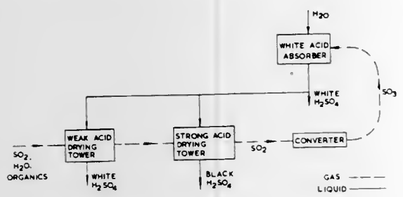
An air filtering system in which the filter elements through which the air passes are composed of an electrically conductive cloth having a high carbon content. The cloth is maintained at a substantial electrical potential relative to electri-

cal ground. The electrical charge is conducted to the particles present in the filter bag, thereby causing mutual repul-



sion and other effects between the charged particles and increasing the gas permeability of the filter system.

3,577,706
SULFUR DIOXIDE DRYING
Leopold Moller, Avonmouth, Bristol, England, assignor to Imperial Smelting Corporation (M.S.C.) Limited, London, England
Filed Aug. 30, 1968, Ser. No. 756,463
Claims priority, application Great Britain, Sept. 20, 1967, 42775/67
Int. Cl. B01d *53/14*
U.S. Cl. 55—30 **4 Claims**

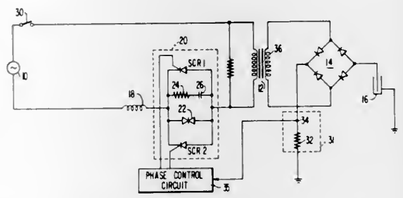


In the production of sulfuric acid, a two-stage drying process for drying gas which contains SO_2, organic material and water by contact with weak sulfuric acid of less than 70 percent strength to absorb a major proportion of the water but little of the organic material and then by contact with strong sulfuric acid to absorb the remaining water and the organic material.

3,577,707
SORPTION
Trevor Raymond White, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England
No drawing. Filed Dec. 19, 1969, Ser. No. 886,784
Claims priority, application Great Britain, Dec. 30, 1968, 61,660/68
Int. Cl. B01d *53/02*
U.S. Cl. 55—68 **9 Claims**

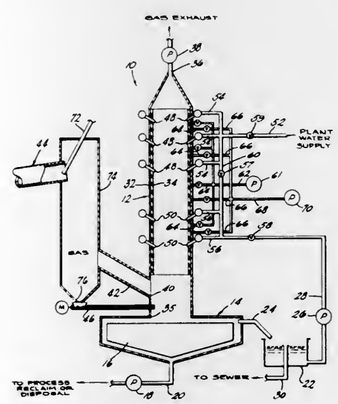
A process for sorbing nitrogen dioxide from a gaseous mixture with air, nitrous oxide or other gases by contact with a polyamide material such as polyhexamethylene adipamide in fibrous, powder or sintered form. The polyamide fibers may also be in bicomponent form wherein one component possesses potentially adhesive properties.

3,577,708
SPARK INTERVAL RESPONSIVE PRECIPITATOR VOLTAGE CONTROL
John W. Drenning, and Richard J. Bridges, Baltimore, Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.
Filed May 28, 1968, Ser. No. 732,615
Int. Cl. B03c *3/66*
U.S. Cl. 55—105 **28 Claims**



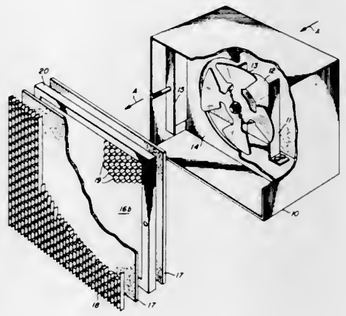
A method and digital circuit for modifying the voltage applied to the electrodes of a precipitator in accord with the elapsed time interval between the presently detected spark and the spark immediately preceding. Four predetermined time intervals are established by astable multivibrators each set by each detection of a spark in the precipitator. The outputs of the multivibrators enable gates to control the application of the next successive spark responsive pulse to a reversible digital counter which controls precipitator voltage. The counter is periodically advanced by clock pulses if the time interval between the detection of the next subsequent sparks falls outside the three shorter of the predetermined time intervals. Advancement of the counter is inhibited if the next subsequent spark responsive pulses occur within the second longest of the predetermined time intervals and the counter is respectively reversed one and two steps if the next subsequent spark responsive pulse occurs within the third longest or shortest of the predetermined time intervals.

3,577,709
GAS WASHER APPARATUS
John G. Hoad, Dearborn, Mich., assignor to John G. Hoad & Associates, Inc., Ypsilanti, Mich.
Filed May 9, 1968, Ser. No. 727,814
Int. Cl. B01f *3/04*
U.S. Cl. 55—228 **6 Claims**



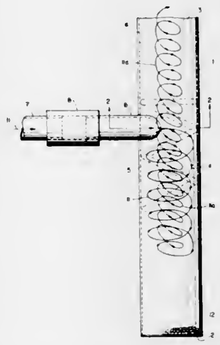
A combined wet scrubber and clarifier or settling basin for removing dust and other particulate matter from exhaust gases associated with various metallurgical and chemical processes.

3,577,710
AIR-TREATMENT APPARATUS
Elliot I. Feldman, 2850 E. Second St., Tucson, Ariz. 85716
Filed Sept. 30, 1968, Ser. No. 763,903
Int. Cl. B01d *53/04*
U.S. Cl. 55—316 **3 Claims**



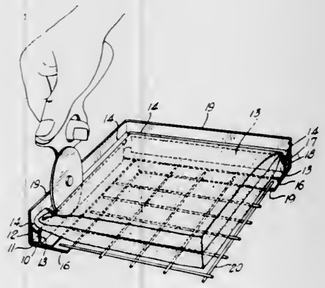
A reactant element for use in air-treating apparatus, including a honeycomblike structure having contiguous channels, the longitudinal axes of which are disposed parallel to the direction of airflow, particulate reactant material disposed within the contiguous channels and a frame which, with the honeycomb structure, forms a unitary cartridgelike assembly which is fully self-supporting in the direction of the airflow.

3,577,711
APPARATUS FOR REMOVING ENTRAINED PARTICLES FROM GASES
Luigi U. De Bernardo, San Dimas, Calif., assignor to the United States of America as represented by the Secretary of Agriculture
Continuation-in-part of application Ser. No. 592,888, Nov. 8, 1966, now abandoned. This application June 2, 1969, Ser. No. 829,125
Int. Cl. B01d *45/12*
U.S. Cl. 55—399 **8 Claims**



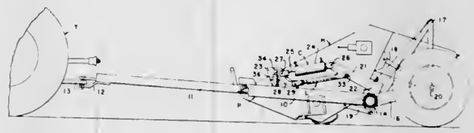
An apparatus for removing entrained particles from gases, of particular use as a spark arrester with internal combustion engines, comprises, essentially, an elongated cylinder, closed at one end and having a spiral member secured to the inner wall. Exhaust gases enter tangentially at a point near the open end and travel in a thin layer along a spiral path adjacent the wall toward the closed end. Near the closed end, the gases reverse direction and travel in an axial spiral path along the center of the cylinder and out the open end, while incandescent carbon particles continue by inertia in their original spiral path and are retained or pulverized by rubbing against the cylinder wall as they continue to circulate at the base of the cylinder. The absence of baffles minimizes back pressure on the engine.

3,577,712
COMBINATION AIR FILTER AND FRAME FOR HOLDING THE SAME
Peter Ballennie, deceased, late of West Hill, Eileen Margaret Ballennie, Executrix, West Hill, Ontario, Canada, and Angelo P. Ruffo, Montreal, Canada, assignors to Industrial Air Filters Limited
Continuation-in-part of application Ser. No. 683,197, Nov. 15, 1967, now abandoned. This application May 28, 1969, Ser. No. 829,163
Int. Cl. B01d *46/10*
U.S. Cl. 55—501 **1 Claim**



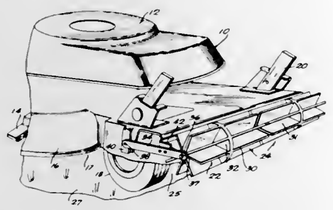
A frame comprising plural frame members in rectangular configuration for removably mounting air filter media. Each frame member has a base and a resilient wall in spaced apart relationship. A rigid finger extends downwardly from the rigid wall towards the resilient wall so that air filter media is gripped between the finger wall and the resilient wall. The frame member has a flange as an extension of the base portion.

3,577,713
HEADER LOCK MEANS FOR AGRICULTURAL HARVESTING MACHINES
Horace G. McCarty; Henry N. Lausch, and Earl A. Hudson, Leola, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed July 26, 1968, Ser. No. 748,021
Int. Cl. A01d *43/10*
U.S. Cl. 56—11.9 **9 Claims**



This invention relates to a header locking means for agricultural harvesting machines having a mobile main frame, and a subframe and harvesting header mounted on the main frame. The subframe and header are mounted as a unit for pivotal movement relative to the main frame about a predetermined transverse axis between a lowered operating position and a fully raised nonoperating, transport or servicing position. Novel safety mechanical locking means in the form of a telescopic link assembly are provided to lock the header unit in a fully raised or intermediate position for various reasons including safety in transport or servicing of the header unit.

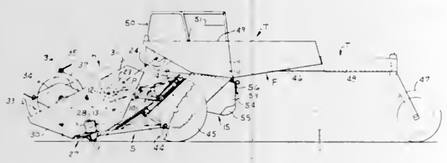
3,577,714
REAR ROLLER GUARD FOR ROTARY MOWERS
Einar S. Dahl, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.
Continuation-in-part of application Ser. No. 649,259, June 27, 1967, now abandoned. This application Aug. 27, 1969, Ser. No. 853,310
Int. Cl. A01d *75/20*
U.S. Cl. 56—17.2 **21 Claims**



A rear roller guard assembly which prevents ejection of missiles rearwardly from beneath a rotary mower blade housing. The roller guard assembly includes two or more paddle wheels having radially extending vanes which are rotatably supported on an axle which is supported rearwardly of the housing by two sidearms. The sidearms are pivotally connected to the mower housing and extend rearwardly therefrom.

In one embodiment, the paddle wheels are located rearwardly of the rear wheel axle. In a further embodiment, the paddle wheels support the rear of the mower housing above the ground. A shield located over the roller prevents the escape of missiles between the rear edge of the mower housing and the roller.

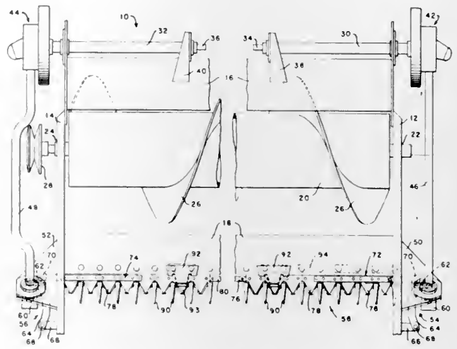
3,577,715
SUSPENSION FOR MOUNTING A HEADER ON A TRACTOR
Lawrence M. Halls, New Holland, and Henry N. Lausch, Leacock, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Apr. 3, 1969, Ser. No. 813,182
Int. Cl. A01d *67/00*
U.S. Cl. 56—208 **9 Claims**



A self-propelled agricultural harvesting machine has a link-type suspension mounting a crop cutting header on a tractor. The suspension comprises two spaced suspension assemblies each having upper and lower links and suspension springs supporting the header in cooperation with ground engaging skid shoes and moving the header on variations in ground level so that cut crops are discharged against the windrow- or swath-forming means underneath the tractor at substantially the same location and having deflection means for smoothly guiding end discharged crops from the long conditioning rolls to the narrower windrow and swath forming means.

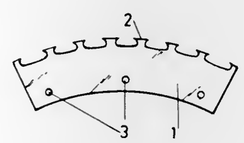
3,577,716
MOWING DEVICE
Horace G. McCarty, Leola; Lawrence M. Halls; Edmund O. Howell, New Holland, and Joseph C. Hurlburt, Leola, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Aug. 26, 1968, Ser. No. 755,318
Int. Cl. A01d *55/02*
U.S. Cl. 56—259 **2 Claims**

A mowing device comprising a frame structure, a split sickle mounted in the frame structure and drive means disposed on either side of said frame structure for independently driving each of said sickle halves so that the knife ele-



ments fixed to the sickle bars cut crop materials directed thereto across the entire length of the sickle.

3,577,717
CUTTING BLADE FOR ROTARY MOWER
Peter J. W. Van Den Munckhof, Meterikseweg 79, Horst, Netherlands
Filed Nov. 15, 1968, Ser. No. 776,211
Claims priority, application Netherlands, Nov. 16, 1967, 6,715,578
Int. Cl. A01d *55/18*
U.S. Cl. 56—295 **2 Claims**

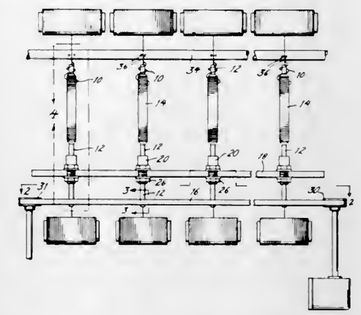


The invention relates to a toothed cutting blade manufactured of thin sheet steel material for a rotary mower and forming at least a portion of a flat ring, its teeth each having an active cutting edge receding from the point of the tooth in respect of the radius going through the said point and an inactive edge being about square to the said radius.

3,577,718
YARN-COVERING MACHINE
James J. Purcell, Wyomissing, Pa., assignor to Sheer Elastic Corporation
Filed Mar. 24, 1969, Ser. No. 809,716
Int. Cl. D02g *3/28, 3/38*
U.S. Cl. 57—18 **3 Claims**

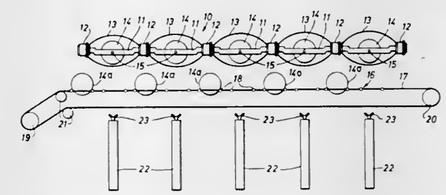
A hollow spindle for the passage therethrough of a yarn to be covered, (herein referred to as the core), by another, (herein referred to as covering filament). The driving spindle of this invention is about double the length of a conventional spindle and it has an irreducibly small diameter. The covering filament is wound in the form of a long, small-diameter, cylindrical cake directly onto the spindle instead of on a bobbin which is mounted on the driving spindle. The spindle is rotated at a rate of speed about three times the rate attainable by conventional machines of this type. The spindle is

mounted for quick and easy removal and replacement and in a manner such that, replacing an empty spindle with a loaded



one will not disturb the closely spaced spindles of a multispindle installation.

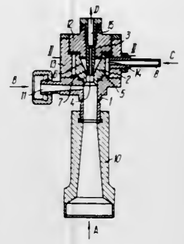
3,577,719
METHOD AND APPARATUS FOR LOADING BOBBINS OR REELS INTO AND OUT OF CRADLES OR MOUNTINGS
Mario Martinez, Dibden Mannor, Dibden Hythe, and Colin Monday, Southampton, England, said Monday assignor to said Martinez
Filed Feb. 25, 1969, Ser. No. 802,096
Claims priority, application Great Britain, Mar. 12, 1968, 11,977/68
Int. Cl. D07b *3/12, 7/00*
U.S. Cl. 57—34 **13 Claims**



The invention comprises a method and apparatus for loading and unloading spools into and out of pintles of a machine having a plurality of spools and the method comprises the steps of loading full spools to be mounted in the supports onto a conveyor, conveying said full spools below said spool supports and locating each spool in a vertical plane displaced to one side of a vertical plane containing the respective axis of the spool support, lowering any empty spools from the spool supports onto the conveyor, operating the conveyor to position each full spool to be loaded in the vertical plane containing the respective axis of the spool support, raising each full spool to be loaded into the respective spool support and then operating the conveyor to convey unloaded empty spools thereon away from the apparatus.

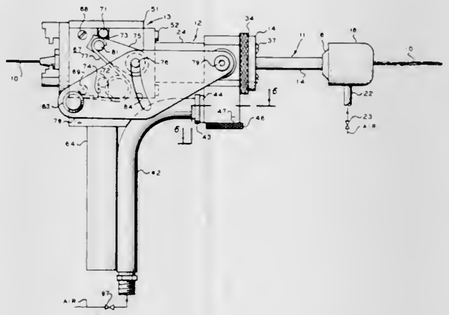
3,577,720
DEVICE FOR TWISTING YARN
Natan Albertovich Zax, B. Eldoradousky pereulok, 1, Kv. 35; Vasily Porfirievich Korzhov, Varshauskoe Shosse, 44/46, Korpus 3, Kv. 84, and Roza Semenovna Rabinovich, Dauyd Kouskaya ulitsa, 34, Korpus 45, Kv. 33, Moscow, U.S.S.R.
Filed Dec. 18, 1968, Ser. No. 784,768
Int. Cl. D01h *7/00*
U.S. Cl. 57—58.89 **2 Claims**

A yarn-twisting device is provided in which twisting single fibers fed into a spinning chamber is carried out by using the energy of an air vortex. The device is provided with means



for creating an intensive vortical air current and a means ensuring a fine adjustment of aerodynamic spinning conditions.

3,577,721
YARN STRING-UP DEVICE
Hayes J. Schmick, and Hans Van Doornewaard, Greenville, S.C., assignors to Phillips Fibers Corporation
Filed Feb. 12, 1969, Ser. No. 798,667
Int. Cl. D01h *7/92;* **D02g** *1/04*
U.S. Cl. 57—77.33 **12 Claims**

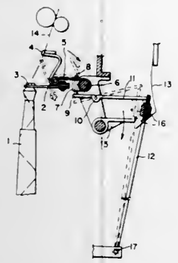


A jet can be utilized to pass yarn through a deflection valve. The direction of rotation of the fluid in the jet and the resulting torque on the yarn can be varied to impart a desired amount of twist to the yarn. The deflection valve can pass the yarn to the next processing station or to waste, as desired, and cuts the yarn upon being charged from one condition to the other.

3,577,722
SENSING DEVICE FOR AUTOMATIC BRAKING OF THE SPINDLE IN RING SPINNING AND RING TWISTING MACHINES
Kazimerz Adamaszek, Komorowice Kreis Bielska-Biaej near, Poland
Filed Mar. 4, 1969, Ser. No. 804,152
Claims priority, application Poland, Mar. 7, 1968, P125,648
Int. Cl. D01h *13/16*
U.S. Cl. 57—80 **9 Claims**

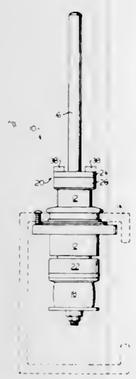
A device which automatically regulates yarn tension including a lever upon which resultant yarn forces act and

which forces are counterbalanced by the weight distribution of the lever: a spindle brake actuator is held in an inactive



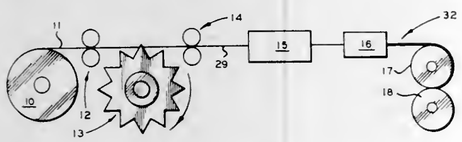
position until released by lever movement occasioned by yarn breakage.

3,577,723
BOBBIN SUPPORT FOR TEXTILE SPINDLE ASSEMBLY
John D. Page, Clemson, S.C., assignor to Maremount Corporation, Chicago, Ill.
Filed Sept. 2, 1969, Ser. No. 854,453
Int. Cl. D01h *7/16, 7/08*
U.S. Cl. 57—129 **10 Claims**



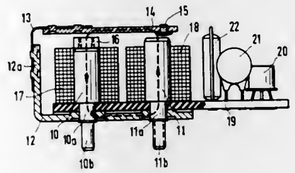
In a bobbin support for a textile spindle assembly, a pair of superposed annular members encircle the spindle blade and are connected to it for positional adjustment in an axial direction by connections of the spline and screw-thread types, respectively. Precise axial adjustment of the elevation of the annular members and of a bobbin mounted upon the spindle blade is made possible, and a nonslip driving connection between the blade and bobbin is provided.

3,577,724
METHOD OF FIBRILLATING AND TWISTING ORIENTED FILM
Max E. Greene, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Jan. 27, 1969, Ser. No. 793,996
Int. Cl. D02g *1/02*
U.S. Cl. 57—157 **5 Claims**



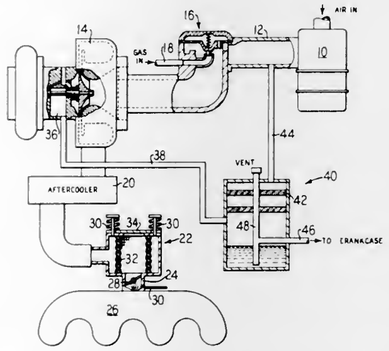
An apparatus and method for fibrillating and texturizing an oriented film of thermoplastic material. The apparatus includes a cutting roller rotatable about a fixed axis for cutting elongate slits in said film. The method comprises moving forming elongate slits in a thermoplastic film and texturizing said slit film by the false twisting technique to form a bulky yarn.

3,577,725
SOUND GENERATOR FOR ALARM CLOCKS
Wolfgang Ganter, Schramberg-Sulgen, and Georg Kunz, Lauterbach, Germany, assignors to Gebruder Junghans G.m.b.H., Schramberg Wurtt, Germany
Filed July 9, 1969, Ser. No. 840,238
Claims priority, application Germany, July 10, 1968, P1,773,812.4
Int. Cl. G04c *9/00*
U.S. Cl. 58—38 **11 Claims**



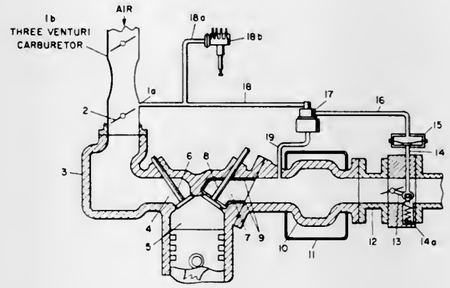
A sound generator for an alarm clock including a mechanical oscillator driven by a transistor circuit. The transistor circuit includes a drive coil on the output and a control coil on the input. The drive coil excites a mechanical oscillator which in turn varies the reluctance of the control coil. The drive and control coils are magnetically coupled together so that the circuit operates initially as a conventional blocking oscillator whose frequency depends upon the values of the circuit elements. Once the mechanical oscillator begins to move, however, the control coil reluctance is affected so as to convert the operation of the circuit into an amplifying circuit which amplifies the pulses on the control coil and operates the mechanical oscillator at its mechanical resonant frequency.

3,577,726
FUEL SYSTEM FOR NATURAL GAS TURBOCHARGED ENGINE
Harold H. Wagner, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed July 24, 1969, Ser. No. 844,517
Int. Cl. F02b *37/00;* **F02m** *21/04*
U.S. Cl. 60—13 **5 Claims**



A turbocharged natural gas engine adapted for use with very low pressure gas by virtue of introducing the gas and combining it with air to provide a combustible mixture upstream of or on the low pressure side of the turbocharger. Safety means are provided to insure against damage by backfire and against admission of explosive gases to the engine crankcase.

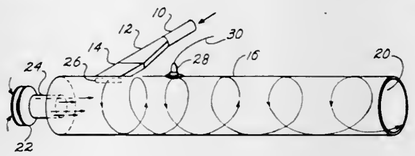
3,577,727
METHOD OF REDUCING INTERNAL COMBUSTION ENGINE EMISSIONS
Joel A. Warren, Birmingham, and Frederick J. Marsee, Clawson, Mich., assignors to Ethyl Corporation, New York, N.Y.
Filed Oct. 7, 1968, Ser. No. 765,361
Int. Cl. F02b *75/10*
U.S. Cl. 60—29 **10 Claims**



A system is described for reducing unburned hydrocarbons and carbon monoxide emitted from internal combustion spark ignition engines. The system comprises means for supplying a leaner-than-stoichiometric air/fuel mixture to the cylinders of the engine for combustion, means for conserving the heat of the exhaust products formed on combustion of the air/fuel mixture, and means for controlling the exhaust back pressure under low power demand. The means for conserving the exhaust heat includes the combination of an insulated exhaust port, insulated exhaust manifold and an insulated exhaust pipe; the back pressure control means consists of a valve placed in the exhaust pipe, said valve being responsive to vacuum signal and an exhaust back pressure signal.

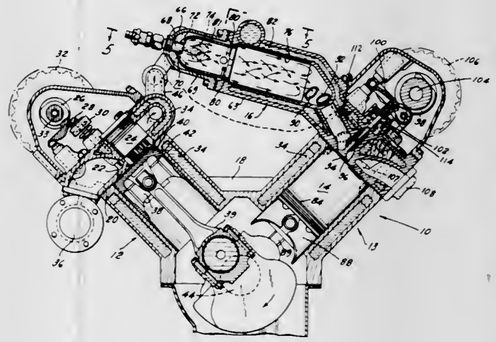
A method of operating an engine utilizing said system is also described.

3,577,728
EXHAUST GAS PROCESSING SYSTEM
Joe W. Von Brimer, Sherman Oaks, and Herman P. Roth, Manhattan Beach, Calif., assignor said Von Brimer to General Scientific Laboratories, Inc., a fractional part interest
Continuation of application Ser. No. 601,468, Dec. 13, 1966, now abandoned. This application Mar. 19, 1969, Ser. No. 809,480
Int. Cl. F01n *3/10*
U.S. Cl. 60—30 **27 Claims**



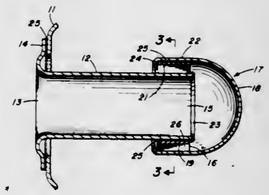
An exhaust gas processing device for use with internal combustion engines which is generally of the afterburner type, including a cylindrical reactor in which the unburned hydrocarbons are consumed and an exhaust pipe connected near one end of the cylindrical reactor in such manner as to direct the flow of gases tangentially into the reactor to produce a vortical flow pattern to assure adiabatic heating and mixing with air from outside the reactor chamber. Various arrangements are described for igniting the mixture in the chamber, for controlling the effective area of the exhaust gas inlet to the reactor and the air inlet to the reactor, for controlling the reactor outlet including additional air mixing means, for compounding the reactors and for using a plurality of reactors for multicylinder engines. Arrangements are also shown for utilizing the heat radiating from the sides of the reactor to heat the incoming air and for conserving the heat by means of an insulating layer or a labyrinth structure which redirects the exhaust flow back across the outside of the reactor cylinder. A still further embodiment utilizes a helical member within the reactor chamber to direct the flow in a vortical pattern which also is effective to reduce sound output.

3,577,729
RECIPROCATING INTERNAL COMBUSTION ENGINE WITH CONSTANT PRESSURE COMBUSTION
Glenn B. Warren, 1361 Myron St., Schenectady, N.Y.
Filed Mar. 11, 1969, Ser. No. 806,159
Int. Cl. F02g *3/02*
U.S. Cl. 60—39.63 **11 Claims**



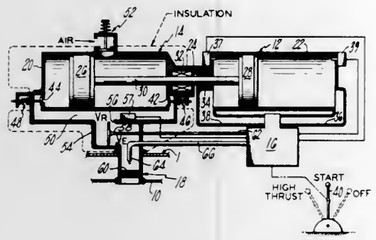
A reciprocating internal combustion engine adapted to provide substantially constant pressure combustion in a combustion chamber separated from the compression and expansion cylinders of the engine is provided.

3,577,730
VAPORIZER CUP
William J. Oliphant, Wakefield, Mass.
Filed July 25, 1969, Ser. No. 844,958
Int. Cl. F23d *11/44*
U.S. Cl. 60—39.71 **3 Claims**



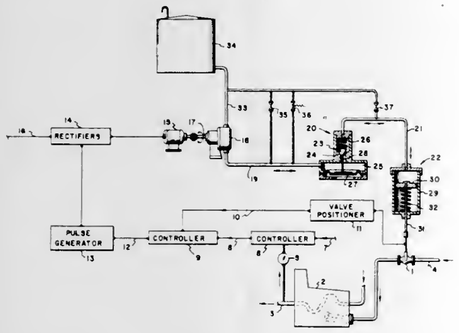
A vaporizer for gas turbine engines formed of three simple parts, a tube, a retaining band and an end cup joined inseparably together to control the passage of the air/fuel mixture through 180° and to vaporize the mixture of contact of the mixture with the forward head plate of the combustion chamber.

3,577,731
ENGINE IGNITION SYSTEM
Raymond J. Bruchez, Jr., Lake Park, Fla., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Aug. 1, 1969, Ser. No. 846,833
Int. Cl. F02c *7/26*
U.S. Cl. 60—39.82 **11 Claims**



An ignition device for a turbine engine wherein said device has means for compressing air to a specified temperature and then directing said air into a combustion chamber. A predetermined metered amount of fuel in injected into the hot air so that auto ignition temperature is reached within the passageways of a catalytic restrictor-emitter. The flame started by the restrictor-emitter is held on its surface as a flame holder while the flame front projects into the combustion chamber to ignite a fuel/air mixture.

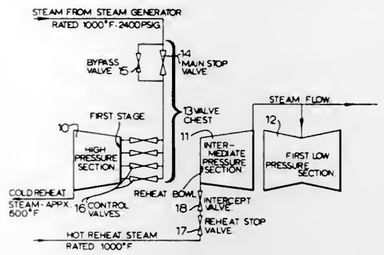
3,577,732
MOTION CONVERSION SYSTEM
Jacobus De Haas, Haren, Netherlands, assignor to Shell Oil Company, New York, N.Y.
Filed May 19, 1969, Ser. No. 825,782
Claims priority, application Netherlands, May 27, 1968, 6,807,442
Int. Cl. F15b *15/18*
U.S. Cl. 60—52 **7 Claims**



A system for the conversion of the rotary movement of a shaft into a corresponding displacement of an element such as a moving element of a control valve.

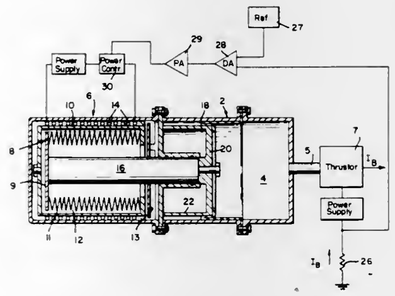
3,577,733
RAPID LOADING OF STEAM TURBINES
Eric Manuel, Peterborough, Ontario, Canada, and James H. Moore, Jr., Scotia, N.Y., assignors to General Electric Company
Filed May 8, 1969, Ser. No. 822,933
Claims priority, application Canada, July 16, 1968, 25,244
Int. Cl. F01k *13/02*
U.S. Cl. 60—105 **3 Claims**

A method for loading a steam turbine and transferring from full arc to partial arc admission during loading while maintaining a constant rate of heating, so as to eliminate the



cooling and reheating which previously took place during a transfer at constant load.

3,577,734
LIQUID-METAL FEED SYSTEM FOR FEEDING PROPELLANT TO AN ION THRUSTOR
Harry J. King, Canoga Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Division of Ser. No. 602,664, Dec. 19, 1966, Pat. No. 3,443,383.
Filed July 19, 1968, Ser. No. 746,114
Int. Cl. F03h *5/00*
U.S. Cl. 60—202 **2 Claims**



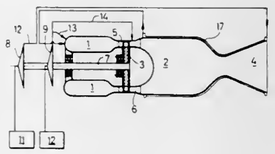
A reservoir of liquid metal is connected to an ion thrustor for a supply of ionizable material thereto. The reservoir is in the form of a reservoir cylinder having a reservoir piston therein. An associated drive cylinder contains a drive piston connected to the reservoir piston. A liquid in equilibrium with its vapor is positioned in the drive cylinder, and as heat is added, the pistons move to deliver liquid metal to the thrustor. The amount of heat supplied to the drive cylinder is preferably a function of the liquid-metal requirements of the ion thrustor.

3,577,735
LIQUID FUEL ROCKET ENGINE CONSTRUCTION
Gunther Schmidt, Ottobrunn-Riemerling, Germany, assignor to Bolkow Gesellschaft mit beschrankter, Haftung, Ottobrunn, Germany
Continuation of application Ser. No. 698,574, Jan. 17, 1968, now abandoned. This application Nov. 5, 1969, Ser. No. 871,644
Int. Cl. F02k *9/02*; **F01d** *9/04*
U.S. Cl. 60—207 **6 Claims**

A liquid fuel rocket engine construction includes the usual main combustion chamber having a nozzle discharge. One or more precombustion chambers are arranged ahead of the main combustion chamber in a position to discharge combustion gases generated therein through turbine blades of an auxiliary turbine arranged directly adjacent the rear end of the main combustion chamber. The auxiliary turbine drives at least two separate fuel component pumps, one of which

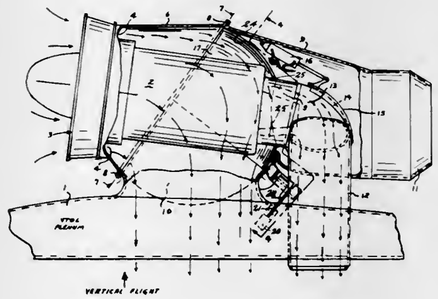
discharges first through the walls of the main combustion chamber for cooling purposes and then into a precombustion chamber, and the other of which discharges only partially into the precombustion chamber and then into the discharge from the auxiliary turbine and into the main combustion chamber. The precombustion chamber is operated either with excess fuel or oxidizer.

The construction includes a preguide lattice or guide fin arrangement for discharging into the turbine blades and in



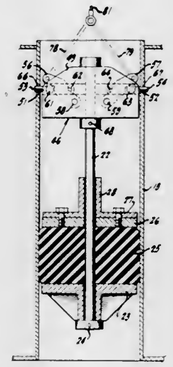
addition in accordance with a feature of the construction, the discharge section immediately after the turbine blades is provided with a retarding afterguide lattice for guiding the fuel discharged by the turbine into the main combustion chamber and also for adding an additional fuel component, either fuel or oxidizer, at such location. In a preferred form, the trailing ends of the afterguide lattice are provided with nozzle discharge openings for facilitating the discharge of the fuel component into the main combustion chamber at such location.

3,577,736
THRUST DIVERTER VALVE
Emerson W. Stevens, Snyder, N.Y., assignor to the United States of America as represented by the Secretary of the Air Force
Filed Aug. 21, 1969, Ser. No. 852,010
Int. Cl. F02k *1/20*
U.S. Cl. 60—226 **8 Claims**



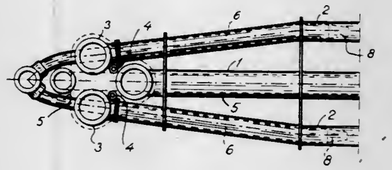
A thrust diverter valve for turbofan jet engines producing two different angular flow patterns for the fan exhaust from a turbofan jet engine, which includes two similar spherical curved portions of half of a split substantially hemispherical shell which are concentrically rotatable in opposite directions in a confining chamber around the axis of a turbofan jet engine with the axis of rotation of each portion of the shell disposed in canted relation with respect to horizontal and vertical flow directions. The spherical shell portions are rotatable about their axis in opposite directions into one position in the path of flow from the fan to form an inclined hemispherical deflector shell and deflect the flow from the fan downwardly at substantially 90° to the fan axis for vertical thrust, and movable about their axis in the opposite directions out of the flow path from the fan and allow the fan flow to pass between the spherical shell portions parallel to the axis of the turbofan jet, without deflection, to provide for horizontal thrust.

3,577,737
WATERTIGHT PLUG FOR TUBULAR PILE WELLS
Hulbert M. Burleson, P.O. Box 301, Russellville, Ala.
Filed Apr. 14, 1969, Ser. No. 815,829
Int. Cl. E02b *17/04*; **E16l** *55/00*; **E21b** *23/06*
U.S. Cl. 61—46.5 **5 Claims**



The invention comprises, in combination with a platform for supporting an oil-drilling rig in offshore-drilling operations, a plurality of tubular pile wells anchored in underwater ground and supporting said platform; each of said wells having a lower set of diametrically opposite aligned sockets therein as well as an upper set of diametrically opposite aligned sockets therein, a watertight plug assembly removably mounted in each of said tubular wells, said assembly consisting of a central axially disposed rod, a lower disc mounted on said rod, an upper disc mounted on said rod in spaced relationship to said lower disc, a compressible rubber member confined between said lower and upper discs and engaging the inner surface of each of said tubular wells to prevent passage of water thereby, a first set of pins movably mounted in said upper disc of said assembly; sad pins being adapted to be moved into the lower set sockets of said pile wells, a setting block fixedly mounted on said rod and a second set of pins movably mounted in said block; said second set of pins being adapted to be moved into said upper set of aligned sockets of each of said pile wells to lock said lower disc against displacement.

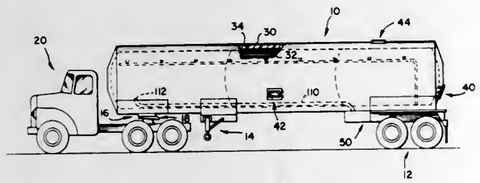
3,577,738
APPARATUS FOR INJECTING SAND BENEATH SUBMERGED CONSTRUCTIONS
Kaj Havno, Copenhagen, Denmark, assignor to Christiani & Nielsen A/S, Copenhagen, Denmark
Filed June 9, 1969, Ser. No. 831,302
Claims priority, application Denmark, June 18, 1968, 2854/68
Int. Cl. E02d *3/12, 27/00*
U.S. Cl. 61—63 **4 Claims**



Apparatus for injecting sand under a construction or excavation in the water in which the construction is temporarily

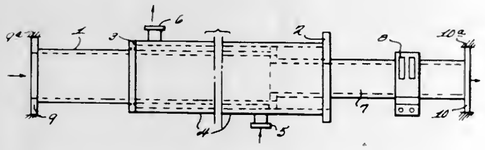
suspended or rests on temporary supports comprising combined feed and suction pipes each having a branch adapted to extend beneath the construction and a branch extending vertically above the surface of the body of water; means for reciprocating or oscillating the branches beneath the construction and including a feedpipe through which a mixture of sand and water can be pumped into the space below the construction, and at least one suction pipe through which a corresponding quantity of water can be extracted or withdrawn from the space into which sand and water are being deposited, and at least a flushing feedpipe through which water can be forcibly ejected to flush suspended or partially deposited lightweight materials.

3,577,739
METHOD AND APPARATUS FOR TRANSPORTING LIQUEFIED GAS
Lawrence A. Botkin, Omaha, Nebr., assignor to Freuhauf Corporation, Detroit, Mich.
Filed Oct. 29, 1968, Ser. No. 771,550
Int. Cl. F17c *5/02, 7/02*
U.S. Cl. 62—45 **16 Claims**



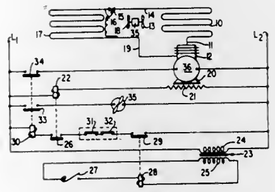
A movable pressure vessel has an insulated wall portion for limiting the temperature rise of liquefied gas therewithin. A relief valve is provided for limiting the pressure within the vessel to establish a working pressure. The filling means of the vessel includes a relief valve for limiting the maximum pressure of the gas entering the vessel to a pressure of approximately 15 p.s.i.g. less than the working pressure of the vessel. Liquefied gas is loaded into the vessel at a maximum temperature and pressure as determined by the relief valve in the filling means, and temperature rise of the liquefied gas during transport is limited so that the pressure produced by the gas does not exceed the working pressure of the vessel. A vapor return means extends along the bottom of the vessel and opens therewithin at a point remote from the outlet means of the vessel and adjacent the front end of the vessel.

3,577,740
VIBRATED REFRIGERATED SURFACE
Jeffrey Stuart Kenworthy, and Hans Berthhold Wiener, Stockton-on-Tees, England, assignors to Imperial Chemical Industries Limited, London, England
Filed Aug. 11, 1969, Ser. No. 849,066
Claims priority, application Great Britain, Sept. 5, 1968, 42217/68
Int. Cl. F25c *1/12*
U.S. Cl. 62—72 **12 Claims**



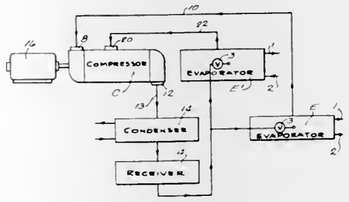
Apparatus for chilling a liquid to produce a slurry includes three coaxial lengths of tube meeting in a junction, one of them being torsionally sonically vibrated and another, which chills the liquid, contacts the liquid on one of its sides and a refrigerant on the other. Extremities of the lengths of tube are supported at nodal points and the junction is at an antinodal point if the vibrated and chilling lengths of the tube are of different diameters. The design is robust whilst avoiding large losses of sonic energy.

3,577,741
REFRIGERATION APPARATUS
David N. Shaw, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed June 2, 1969, Ser. No. 829,417
Int. Cl. F25b *43/02*
U.S. Cl. 62—84 **2 Claims**



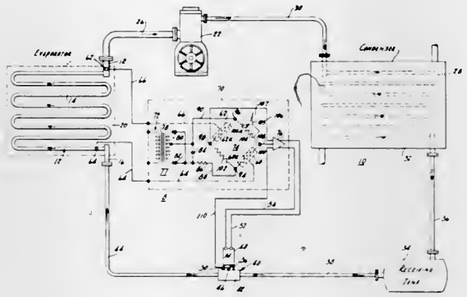
A refrigeration circuit comprising a motor-driven compressor, a condenser, an evaporator, and expansion means. The compressor includes an oil reservoir, where a supply of oil is disposed for lubricating the compressor during normal operation thereof. Associated with the compressor is a heating element, operable to heat the oil when the compressor is inoperable. A safety switch prevents the compressor from becoming energized if the heating element has not functioned while the compressor was inoperable.

3,577,742
REFRIGERATION SYSTEM HAVING A SCREW COMPRESSOR WITH AN AUXILIARY HIGH PRESSURE SUCTION INLET
Erich J. Kocher, Milwaukee, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.
Filed June 13, 1969, Ser. No. 832,979
Int. Cl. F25b *5/00*
U.S. Cl. 62—199 **8 Claims**



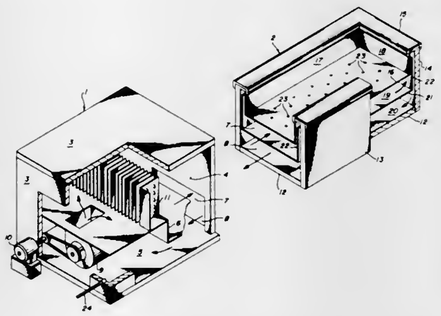
A refrigeration system having a screw compressor for compressing low pressure suction gas that is received from an evaporator and compressing it and discharging it into a condenser; including an auxiliary high-pressure suction inlet to the compressor for conducting high-pressure suction vapor from a pressure-reducing means and to the compressor for being compressed along with low-pressure suction vapor. The invention is used with a refrigeration system having either two operating suction pressure levels, or having a single suction level. The high-pressure suction vapor is introduced into the compressor at a point after the low-pressure suction is cut off, and therefore no reduction in the low-pressure suction capacity results. Increased compressor capacity is thus accomplished by the addition of this high pressure vapor.

3,577,743
CONTROL FOR REFRIGERATION SYSTEMS
Joseph N. Long, Wauwatosa, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.
Filed June 10, 1969, Ser. No. 831,873
Int. Cl. F25b *41/00*
U.S. Cl. 62—212 **8 Claims**



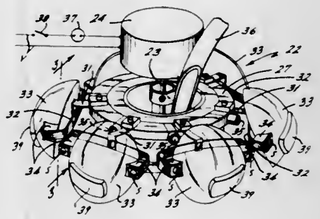
A control system for a refrigeration system employs first and second temperature sensors located in the system evaporator to control the superheat condition of the system refrigerant. One temperature sensor senses the temperature of liquid phase refrigerant in the evaporator while the other temperature sensor senses the temperature of gaseous phase refrigerant in the evaporator. The temperature sensors are connected to a differential temperature control means which regulates the system expansion valve in accordance with a desired differential temperature or superheat condition between the liquid and gaseous phase refrigerant.

3,577,744
DRY AIR REFRIGERATED DISPLAY CASE SYSTEM
John F. Mercer, P.O. Box 143, Globe, Ariz. 85501
Filed Dec. 29, 1969, Ser. No. 888,289
Int. Cl. A47f *3/04;* **F25b** *5/00*
U.S. Cl. 62—256 **4 Claims**



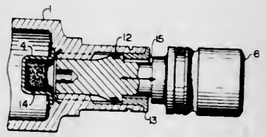
In order to provide an open refrigerated display case in which the product zone remains frost-free and in which the evaporator coils remain ice-free, a small secondary evaporator unit is utilized to dry ambient air which is stored under pressure and metered into the air flow path of the primary cooling system. The display case is coilless, the depressed temperature being maintained primarily through conduction panels forming the bottom and walls of the product zone, which conduction panels are disposed in intimate contact with the refrigerated air supply from the primary evaporator unit. Apertures through the conduction panels are provided to leak cold dry air into the product display zone to attain spillage at a low rate. System efficiency is increased by providing baffles to insure intimate contact of the dry refrigerated air against the thermally conductive panels comprising the walls as well as the bottom panel of the product zone.

3,577,745
ICE MAKING APPARATUS
Elmer W. Zearfoss, Jr., Philadelphia, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.
Filed May 23, 1969, Ser. No. 827,239
Int. Cl. F25c *1/10*
U.S. Cl. 62—345 **7 Claims**



Centrifugal ice-freezing apparatus including a plurality of flexible or otherwise deformable molds or pockets disposed in circular array, and having open portions presented radially inwardly toward a central axis about which they are rotatable. Means is provided for filling the pockets, and for rotating them to retain water therein by centrifugal force. While rotating, the molds are flexed and pivoted to ice freezing position, and are subjected to below freezing temperatures until the water is frozen. Upon freezing of the water, rotation is halted to accommodate both flexing and pivoting of the molds to ice ejecting position.

3,577,746
SELF-CONTAINED LUBRICATION SYSTEM FOR HIGH SPEED DRIVE SHAFT COUPLING
Clarence F. Dolan, Erie, Pa., assignor to General Electric Company
Filed Jan. 29, 1969, Ser. No. 795,116
Int. Cl. F16d *3/06*
U.S. Cl. 64—23 **1 Claim**

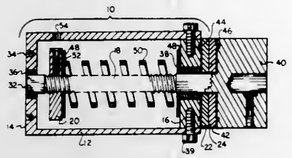


A self-contained lubrication system for a splined high speed drive shaft coupling. One of the splined shafts is coated with a mixture of a solid lubricant and grease. A grease reservoir is mounted on one of the shafts to replenish the lubricant required at the spline surfaces. Rotation of the shafts forces the oil in the grease from the reservoir onto the spline surfaces thereby constantly replenishing the oil content of the lubricant mixture provided at the spline surfaces.

3,577,747
TORQUE LIMITING CLUTCH
James Murrell Brown, Box 1388, Levelland, Tex.
Filed June 17, 1969, Ser. No. 833,955
Int. Cl. F16d *7/00*
U.S. Cl. 64—29 **3 Claims**

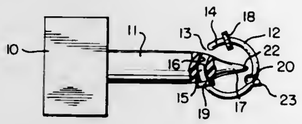
A self-aligning, adjustable torque-limiting clutch has a can-shaped body which is attached to the driving shaft. A bolt is attached to the driven shaft and the bolt extends through the body and journaled at each end thereof for alignment sup-

port. One serrated plate is attached to the body and another serrated plate to the bolt and the serrated plates are held



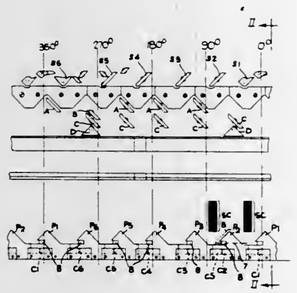
together by a compression spring inside the body, acting against an adjustable nut on the bolt.

3,577,748
DEVICE FOR HAND KNITTING
Dena S. Nortland, 46 Washington Ave., Dumont, N.J.
Filed Mar. 2, 1970, Ser. No. 15,681
Int. Cl. D04b *3/00*
U.S. Cl. 66—4 **6 Claims**



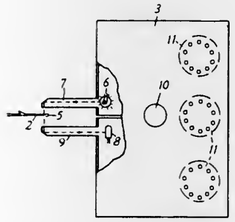
A device for use in knitting by hand which includes a bar adapted to be held in one hand and having a series of aligned posts on which are mounted yarn-receiving members respectively. The said members have oppositely disposed confronting ends which are spaced apart to provide openings therebetween. The yarn-receiving members are mounted on the posts for relative movement to dispose said members in any one of three positions, namely a position in which said openings between the confronting ends of said members are closed, a position in which passageways into said members are provided on one side of the posts respectively and a position in which passageways are provided on the opposite side of the posts respectively. Means is also provided forming stops for limiting the movement of said yarn-receiving members respectively.

3,577,749
CIRCULAR KNITTING MACHINES
Dennis Wright, Aylestone, England, and Thomas Adams, West Knighton, England, assignors to The Bentley Machine Development Company Limited
Filed July 18, 1968, Ser. No. 745,753
Claims priority, application Great Britain, July 22, 1967, 33820/67
Int. Cl. D04b *15/32, 15/68*
U.S. Cl. 66—50 **4 Claims**



A needle selecting system in a circular knitting machine employing rockable selecting instruments cooperating with needles in the needle cylinder tricks, such instruments being adapted to be projected from their tricks and to have particular ones depressed selectively to miss a raising cam which the others engage, wherein the instruments are controlled by cam means so organized that instruments which through being depressed have remained at low level are rocked to project them out of their tricks before the remaining instruments raised by the raising cam have been subsequently lowered to the low level, means being provided to cause a fresh selection to be made immediately after the raised instruments descend to the level of those not raised. Thereby the needle selection and its subsequent cancellation are performed in a shorter than normal circumferential distance round the needle cylinder, this being particularly advantageous in a multifeed machine.

3,577,750
INSPECTION APPARATUS FOR CIRCULAR KNITTING MACHINES
Joseph Venczel, St. Lawrence, Jersey, Channel Islands, Great Britain, assignor to Electronit Limited, St. Lawrence, Jersey, Channel Islands, Great Britain
Filed July 18, 1969, Ser. No. 843,005
Claims priority, application Great Britain, July 22, 1968, 34979/68
Int. Cl. D04b *35/18*
U.S. Cl. 66—157 **7 Claims**

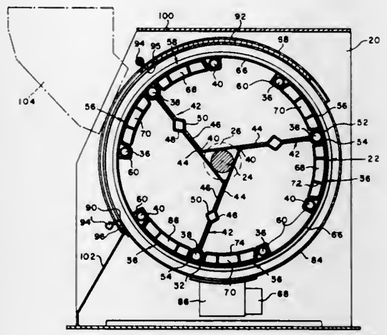


Inspection apparatus in combination with a circular knitting machine, the apparatus performing the function of detecting a broken knitting needle and giving an alarm or stopping the machine in response to such detection. A sensing arrangement of a photoelectric or magnetic kind is positioned near the needles as they rotate and is so arranged to give curved pulses of amplitude corresponding to the size of the needle. A timing circuit gives an initial timing pulse when the amplitude of the curved pulse rises above a predetermined level and a final timing pulse when the amplitude of the curved pulse falls below the predetermined level. A multivibrator is triggered or synchronized to give reference pulses to predetermined lengths in response to each initial timing signal. Reference pulses are applied to a gate which is closed during the periods between initial timing signals and the following final timing signals. If a reference pulse or part of it is applied to the gate at any other time an alarm output signal is given. The multivibrator may be a monostable circuit, in which case gaps between groups of needles do not give an output or it may be a free-running multivibrator in which case missing needles are also detected.

3,577,751
THREE-COMPARTMENT SIX-DOOR WASHER AND EXTRACTOR
Max Hertig, and Peter J. Meier, Syracuse, N.Y., assignors to G. A. Braun, Inc., Syracuse, N.Y.
Filed Feb. 13, 1969, Ser. No. 798,973
Int. Cl. D06f *37/08, 37/10*
U.S. Cl. 68—143 **2 Claims**

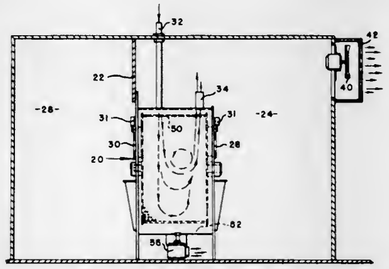
Laundry washer and extractor having a perforate wash drum rotatable on a horizontal axis, partitions within the drum dividing the drum into three like compartments, separate access doors for each compartment disposed adjacent each compartment partition, and a surrounding stationary shell for retaining wash and rinse water, and having a

sump and rain valve and having an arcuate doorway in one side thereof extending from levels above and below the drum



axis by amounts substantially the circumferential width of the drum doors, and a door for the arcuate shell doorway.

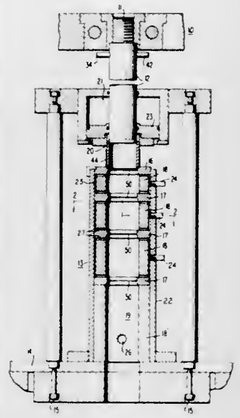
3,577,752
LAUNDRY APPARATUS
Max Hertig, and Peter J. Meier, Syracuse, N.Y., assignors to G. A. Braun, Inc., Syracuse, N.Y.
Filed Nov. 12, 1968, Ser. No. 775,088
Int. Cl. D06f *39/14*
U.S. Cl. 68—210 **4 Claims**



Institutional laundry equipment including laundry washing and extracting apparatus having a substantially airtight casing, with separate loading and unloading doors, disposed in a partition dividing a laundry area into a laundry-receiving room and a clean laundry room, the receiving room having an exhaust fan for maintaining subatmospheric pressure in the receiving room, an air duct connecting the casing with outside air, port means in the casing opening into the receiving room, and interlocking means for the doors to maintain at least one of the doors closed at all times, the port means being either an air duct or a casing water dump valve open to the receiving room or both.

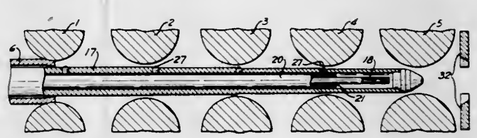
3,577,753
METHOD AND APPARATUS FOR FORMING THIN-WALLED CYLINDRICAL ARTICLES
Dipak C. Shah, Bethlehem, and Louis S. Schwartz, Schnecksville, Pa., assignors to Bethlehem Steel Corporation
Filed Sept. 30, 1968, Ser. No. 763,715
Int. Cl. B21d *22/28, 37/16, 37/18*
U.S. Cl. 72—41 **5 Claims**

A method and apparatus for forming thin-walled containers from flat blanks is disclosed herein. The flat blanks are precoated with a dry film lubricant and drawn and ironed through a series of dies. Apparatus is provided to prevent the



thermal breakdown of the lubricant comprising an internally fluid-cooled punch and fluid-cooled dies.

3,577,754
PROCESS AND APPARATUS FOR ROLLING SEAMLESS TUBES
Albert H. Calmes, 4, Avenue DuJaman, Lausanne, Switzerland
Division of Ser. No. 421,845, Dec. 29, 1964, Pat. No. 3,394,568.
Filed May 14, 1968, Ser. No. 728,938
Claims priority, application Great Britain, Sept. 9, 1964, 36988/64
Int. Cl. B21b *45/02, 27/10, 17/04*
U.S. Cl. 72—45 **6 Claims**

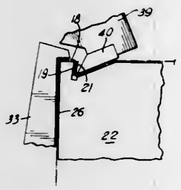


A hollow metal blank is rolled forward upon an advancing hollow tapered mandrel to reduce the wall thickness of the blank in longitudinally-spaced steps and thereby elongate it and form gaps around the mandrel between those steps. Lubricant is forced into the mandrel and discharged laterally from it into at least one of said gaps to fill it. The lubricant is prevented from flowing from the gaps back into the mandrel as the gaps are shortened by the advancing mandrel, so the shortening of the gaps with their restricted rear ends increases the pressure on the lubricant above the supply pressure.

3,577,755
SLEEVE FOR PROTECTING THE PEG IN THE HEAD OF A CARBON ANODE ELECTRODE AND APPARATUS FOR PRODUCING THIS SLEEVE
Karl Fricker, Meilen, Zurich, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland
Division of Ser. No. 582,117, Sept. 26, 1966.
Filed Dec. 24, 1968, Ser. No. 786,571
Int. Cl. B21d *39/02*
U.S. Cl. 72—51 **4 Claims**

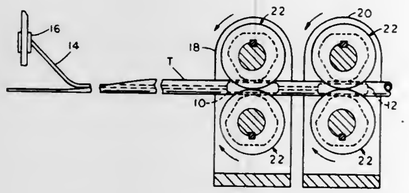
Sleeve-forming apparatus comprising a former of rectangular section around which a strip of sheet aluminum is arranged to be bent to form the sleeve or tube and which has three smooth faces for forming the three flat walls of the tube and a fourth face formed with a V-shaped groove extending

parallel to the edges of the former with the base of the groove adjacent to that face of the former over which the wall of the tube which will carry the part of the fourth wall of the tube on which the first flange is formed, a pressure jaw for clamping the aluminum strip against the middle of the three flat faces of the former, a pair of shaping jaws which are arranged to be swung up so that they each closely embrace a different one of the other two flat faces and part of



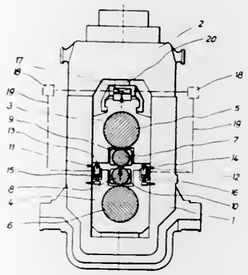
the grooved face of the former in order to bend the strip which is clamped by the clamping jaw against one flat face of the former along the other two flat faces of the former and over the grooved face of the former, and an element having a folding edge which is arranged to be swung against the grooved face of the former so that the folding edge enters the V-shaped groove and forms the first flange and the inclined portion and second flange on the edges of the strip by forcing them into the groove of the former.

3,577,756
TWO-PASS WELD BEAD FINISHING PROCESS FOR PIPE AND TUBING
James E. Cramer, Rte. 6, Box 118, Burlington Township, Racine County, Wis.
Filed June 4, 1969, Ser. No. 830,374
Int. Cl. B21b *21/00, 17/10*
U.S. Cl. 72—193 **4 Claims**



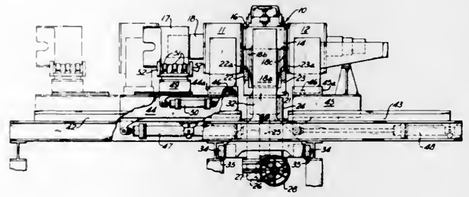
This invention relates to apparatus for removing an internal weld bead from longitudinally welded metal tubing during longitudinal movement of the tubing. The apparatus has a plurality of spaced-apart plugs each positioned axially within the tubing and having a diameter portion in simultaneous contact with the weld bead and an opposite internal surface area of the tubing. Separate means are associated with each plug for sequentially applying a compressive force to the tubing over an external surface area thereof adjacent the plug to compress the tubing against the contacting diameter portions of the plug. During force application the plug moves axially a distance with the tubing. The plug is flexibly anchored which permits it to return to its original position upon release of the compressive force.

3,577,757
ROLLER FRAME STRUCTURE WITH ONE OR MORE PRESSING DEVICES FOR MAINTAINING CONSTANT THE GAP BETWEEN THE ROLLERS
Ernst H. Barten, Buschhutten, Germany, assignor to Achenbach Sohne G.m.b.H., Buschhutten near Siegen, Germany
Filed Mar. 14, 1968, Ser. No. 713,192
Claims priority, application Germany, June 27, 1967, A56096
Int. Cl. B21b *31/30, 31/32*
U.S. Cl. 72—237 **6 Claims**



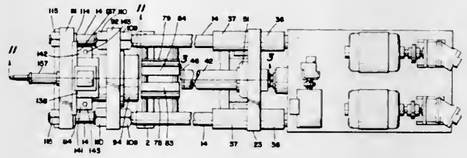
Roller frame in which the rollers are urged toward each other under a certain preload as by a threaded spindle with hydraulic piston-cylinder means acting between the rollers in separating direction. The pistons bottom in the cylinders at a predetermined point and the cylinders are supplied with fluid under pressure in conformity with the movement of the rollers away from each other when a strip is passing therebetween.

3,577,758
APPARATUS FOR EXTRACTING CHOCKS, GUIDES, AND COUPLINGS FROM ROLL ASSEMBLIES
James Richard Adair, Pittsburgh, Pa., assignor to United Engineering and Foundry Company, Pittsburgh, Pa.
Filed Apr. 21, 1969, Ser. No. 817,881
Int. Cl. B21b *31/08*
U.S. Cl. 72—239 **13 Claims**



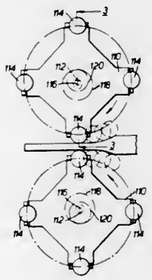
The roll-disassembling apparatus disclosed is provided with saddle surfaces to support a roll assembly by engaging neck portions on the roll which are located between the bearing chocks and roll body. These saddle surfaces form part of a cradle assembly that is vertically movable to locate a roll assembly at a desired elevation where disassembling thereof takes place. At each side of the roll body there is provided a movable car having latches to support and extract a rest bar along with a roll guide mounted thereon. A coupling member at one end of the roll assembly is extracted by a movable carriage having a coupling support platen that may be elevated by a screwjack. The bearing chocks are next extracted from the roll journals by displaceable sleds, each having a chock support platen that may be elevated by a screwjack. The carriage used to remove the coupling member is independently supported by one of the chock-extracting sleds.

3,577,759
METHOD OF AND APPARATUS FOR PREPARING COPPER AND BRASS BILLETS FOR EXTRUSION INTO HOLLOW SHELLS
Paul Tandler, Clayton, Mo., and Ellis R. Blackwell, East St. Louis, Ill., assignors to Cerro Corporation, New York, N.Y.
Filed Mar. 13, 1968, Ser. No. 712,857
Int. Cl. B21c *23/01*
U.S. Cl. 72—254 **13 Claims**



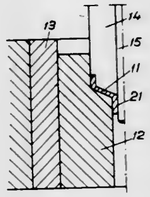
This invention is concerned with a prepiercing and scalping method, in which the billet is precompressed, pierced and scalped, in a substantially continuous closely controlled operation, in a single press, for the purpose of preparing the billet for subsequent extrusion in an extrusion press. The method is designed to prevent distortion or deflection of the piercing mandrel, prevent the wear and tear encountered in the conventional extrusion cycle, and to save time. Provision is made for removal of the slug or breakout resulting from the prepiercing operation, as well as to sever the scalped material into easily removable segments or parts. The invention is further concerned with a press of novel construction for performing the method.

3,577,760
ROLL FORGING MACHINE
Rolf Franke, Osterath, Germany, assignor to Brightside Foundry & Engineering Company Limited, Sheffield, Yorkshire, England
Filed Dec. 18, 1968, Ser. No. 784,784
Claims priority, application Great Britain, Dec. 18, 1967, Aug. 17, 1968, 57417/67;39456/68
Int. Cl. B21b *13/20*
U.S. Cl. 72—215 **12 Claims**



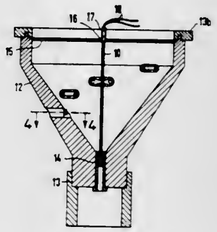
A forging machine comprising at least two roll carriers arranged on opposite sides of material to be reduced. Each roll carrier includes a bush having one or more arms attached thereto. Work rolls are arranged in the ends of the arms. The roll carriers are moved in noncircular paths, the paths being somewhat flattened when engaging the material to be reduced. The machine also includes means for altering the distance between the work rolls in the flattened portion of their paths.

3,577,761
METHOD OF MANUFACTURING COMPONENTS FROM A PART PROJECTING FROM A LARGER PART, HAVING SLIM AND/OR ELONGATED FORM
Eskil Monestam, Umea, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Mar. 4, 1968, Ser. No. 711,829
Claims priority, application Sweden, Mar. 7, 1967, 3082/67
Int. Cl. B21c *23/00*
U.S. Cl. 72—256 **2 Claims**



In the manufacture of objects or components with one part having larger dimensions and one part having slim and/or elongated form, a billet is used which in a first step is forged, preferably cold-forged to a blank with decreasing cross section. This blank is thereafter, possibly after annealing and machining, extruded by means of liquid pressure to the desired shape and dimension at the narrow end of the blank.

3,577,762
METHODS AND DEVICES FOR THE DYNAMIC TESTING OF MATERIALS
Erhard Hornbogen, Gottingen; Erwin Niessner, Neuenburg, Baden, and Gert Buck, Bad Uberkingen, Germany, assignors to Buck K. G., Bad Uberkingen, Germany
Filed Mar. 27, 1969, Ser. No. 811,053
Int. Cl. G01n *3/08*
U.S. Cl. 73—12 **7 Claims**

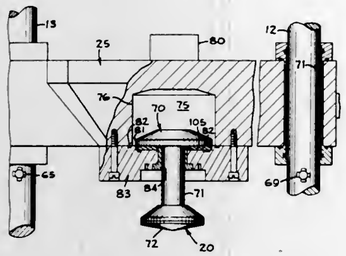


A conical housing is provided with a stick of explosive disposed axially within the housing. The apex angle of the housing is chosen so that a shock wave front produced by igniting the explosive is tangential to an internal conical wall of the housing. A plurality of measurement sites are disposed over the internal wall and specimens to be tested are mounted therein. The stick of explosive is ignited and the resulting distortion of the specimens is observed.

3,577,763
APPARATUS FOR SELECTIVELY PROGRAMMING DIFFERENT TYPES OF SHOCK TESTS
John O. Beal, Pacific Grove, Calif., assignor to Monterey Research Laboratory, Inc., Monterey, Calif.
Filed June 2, 1969, Ser. No. 829,405
Int. Cl. G01n *3/08*
U.S. Cl. 73—12 **7 Claims**

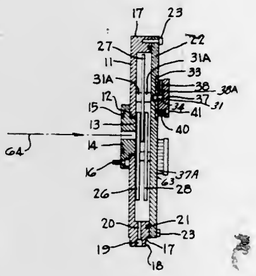
Apparatus for selectively programming different types of shock tests in which a movable shock table is moved toward

a reaction mass. A programmer in series with the shock table and the reaction mass controls the shock pulse produced by the impact between the shock table, the programmer and the



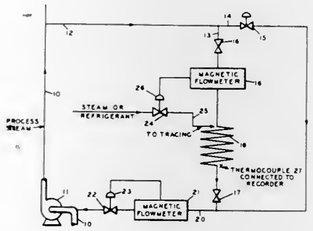
reaction mass. The movable shock table is formed with a gas filled chamber. The programmer includes a piston and an elastomer assembly. The piston is received by the gas filled chamber formed in the movable shock table.

3,577,764
TARGET HOLDING CONTROL UNIT
Abraham L. Korr, Philadelphia, Pa., assignor to the United States of America as represented by the Secretary of the Army
Filed Aug. 14, 1969, Ser. No. 850,129
Int. Cl. G01n *3/08*
U.S. Cl. 73—12 **6 Claims**



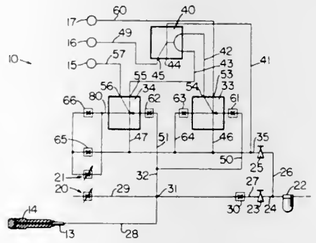
A multitarget holding control unit for collecting specimens from a particle accelerator arrangement normally operating under a vacuum condition to enable performance studies in the hypervelocity impact phenomena of accelerated small solid particles having a size on the order of 10^{14} cm. in diameter. A cup-shaped housing has its base secured to the hub of a centrally apertured adapter for sealed connection to a particle accelerator arrangement. A plurally apertured cover, sealingly secured to an outward face of the cup peripheral sidewall, supports respective target plate shafts, index means and control knob. Within the completely sealed unit, a plurality of overlapping and longitudinally spaced target plates are arranged on their shafts such that a peripheral target space on each target plate disc can be simultaneously aligned with the adapter aperture. Each of the peripheral targets on each plate is provided with an electrical conductive means to collect electrical charges carried by particles and controllingly delivered through the adapter aperture to the peripherally mounted target.

3,577,765
APPARATUS FOR DETERMINING CRYSTALIZATION TEMPERATURE
Joseph Bertoglio, Collinsville, Ill.; Philip L. Deming, St. Louis, Mo.; Joyce G. Eckert, Columbia, Ill., and James R. Shafer, Bridgeton, Mo., assignors to Monsanto Company, St. Louis, Mo.
Filed Dec. 26, 1967, Ser. No. 693,211
Int. Cl. G01n *1/00*
U.S. Cl. 73—17 **6 Claims**



Method and apparatus for automatically determining the crystallization temperature of a flowing liquid. Temperature control means are adapted to vary the liquid viscosity within a crystallization zone. Changes in flow or pressure drop caused by the viscosity changes provide the basis for temperature control. Because operation of the system is cyclic, the effects of heat of crystallization of the liquid can be observed on a recording of crystallization zone temperature, thus identifying the crystallization temperature.

3,577,766
FLUIDIC GAGE
John H. Walker, Dayton, Ohio, assignor to The Bendix Corporation
Filed Jan. 23, 1969, Ser. No. 793,270
Int. Cl. G01b *13/10*
U.S. Cl. 73—37.9 **18 Claims**

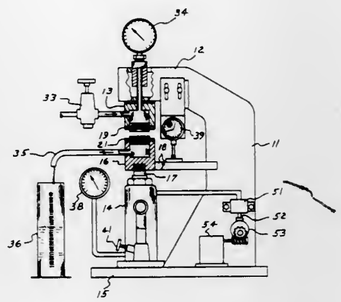


A fluidic gauge for determining acceptability of workpieces wherein such gage has its principal operating components made free of moving parts, utilizes a pair of pneumatic trigger switches to classify gauging signals into a predetermined acceptable range, and utilizes on-off type indicating means operatively connected to the trigger switches to indicate the character of each workpiece being checked.

3,577,767
FELT PERMEABILITY TESTING APPARATUS
Udino Stedile, Pinnerolo, Italy, assignor to Beloit Corporation, Beloit, Wis.
Filed Nov. 24, 1969, Ser. No. 879,289
Int. Cl. G01n *15/08*
U.S. Cl. 73—38 **2 Claims**

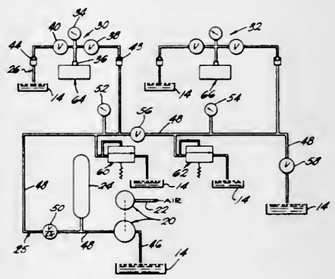
Various permeability characteristics of a sample of felt or other permeable web materials are determined by testing ap-

paratus comprising a pair of interchangeable platens between which the sample is subjected to controlled compression as a measured flow of liquid is forced through the sample from



one platen to the other along a predetermined flow path established by the particular pair of platens installed in the apparatus.

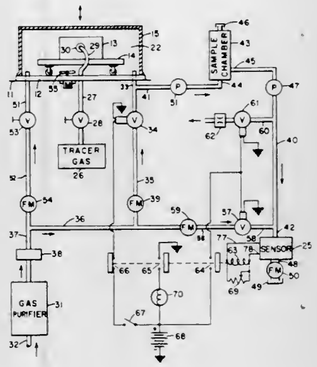
3,577,768
HYDROSTATIC TESTING APPARATUS
Theophil Aprill, Jr., and John R. Leerkamp, Ann Arbor, Mich., assignors to A & L Battery & Electric Service, Inc., Ann Arbor, Mich.
Filed Sept. 2, 1969, Ser. No. 854,614
Int. Cl. G01m *3/26*
U.S. Cl. 73—40.5R **14 Claims**



Portable apparatus for hydrostatically testing hydraulic equipment such as hydraulic-electric and air-over-oil car, truck and bus lifts, hydraulic dock leveling devices, hydraulic docks, and the like, to ensure its safe functioning and for preventative maintenance. The apparatus includes a reservoir for hydraulic fluid, supply means for supplying hydraulic fluid under pressure to the equipment being tested, a pressure gauge assembly including a fitting for connection to the equipment being tested and a pressure gauge in communication with the fitting for registering the pressure in the equipment, and valve means for isolating the gauge and the fitting from the supply means.

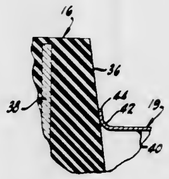
3,577,769
LEAK-DETECTION SYSTEM
John Alfred Roberts, Lynnfield Center, Mass., assignor to General Electric Company
Filed Apr. 2, 1969, Ser. No. 812,710
Int. Cl. G01m *3/20*
U.S. Cl. 73—40.7 **10 Claims**

Leak-detecting apparatus having an enclosure for a container to be tested providing a sample gas accumulator. The container is charged with a tracer gas which in the case of a leak, flows into the accumulator from which it is pumped through a sample gas conduit to a gas sensor sensitive to the tracer gas. The sensor activates valves to supply a purging gas



to the sample gas conduit to purge the sensor thereby cutting of all flow of tracer gas to the sensor. This occurs before saturation of the sensor thereby preventing saturation with the resultant long recovery time.

3,577,770
TEST-CLOSURE FOR OPEN-TOPPED CONTAINERS
Stanley B. Shaw, Sunol; Ronald H. Gehl, and Gordon R. Roemer, Fremont, Calif., assignors to C T Supply Co., Fremont, Calif.
Filed May 5, 1969, Ser. No. 821,793
Int. Cl. G01m *3/32*
U.S. Cl. 73—49.8 **7 Claims**

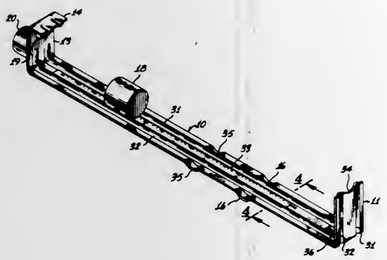


A test closure for use in an automatic can-testing machine operative to test open-topped containers prior to their being filled with a food product and sealed to make certain that an airtight chamber is established by the sidewall and bottom closure attached thereto. The test closure includes a thick resilient pad engageable with the angularly disposed, outwardly flared rim of such container to establish an hermetic seal therewith. The face of the test closure pad engageable with the container rim has an angular disposition essentially corresponding to that of the rim so as to be engageable with a relatively wide surface portion thereof.

3,577,771
SWING-WEIGHT AND STATIC WEIGHT BALANCE FOR GOLF CLUBS
Karsten Solheim, 10412 North 37th St., Phoenix, Ariz.
Filed Aug. 30, 1968, Ser. No. 756,535
Int. Cl. G01m *1/12*
U.S. Cl. 73—65 **9 Claims**

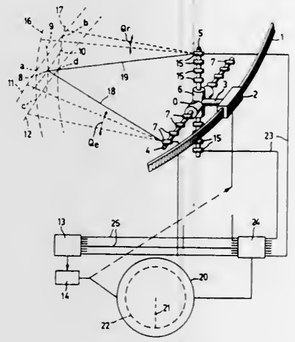
Apparatus for measuring swing weight and static weight of golf clubs adapted to employ a table or counter top as a base is provided by an elongated rigid member having: a first upright section at one end thereof to support a golf club shaft; a second upright section at the other end to hold the grip end of the club; and two longitudinally displaced rockers

functioning as fulcrums between the two end sections. The position of a balance weight is adjusted to balance the rigid member on one rocker with a golf club held by the upright sections with the shaft supported by the first upright section and extending away from the second upright section. For measuring the swing weight of clubs without grips, there is provision for adjusting the position of each club so held rela-



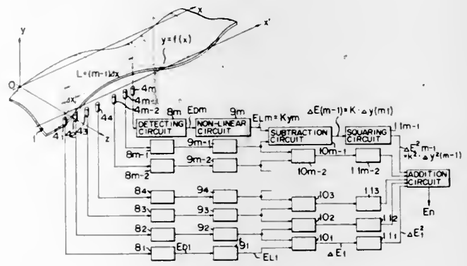
tive to the upright sections depending on the length of its shaft. For measuring static weight, the club is held with its shaft transverse the elongated rigid member at the one end thereof and balance is obtained on the second rocker by adjusting the position of the balance weight. Swing weight or static weight is then read on a scale from the position of the balance weight, depending upon which rocker is used.

3,577,772
DEVICE FOR DIAGNOSTIC EXAMINATION BY ULTRASONIC OSCILLATIONS
Jean Perihou, Bourg La Reine, and Michel Joseph Auphan, Neuilly Sur Seine, France, assignors to U.S. Philips Corporation, New York, N.Y.
Filed May 8, 1967, Ser. No. 637,000
Claims priority, application France, May 6, 1966, 60559
Int. Cl. G01n *29/04*
U.S. Cl. 73—67.7 **8 Claims**



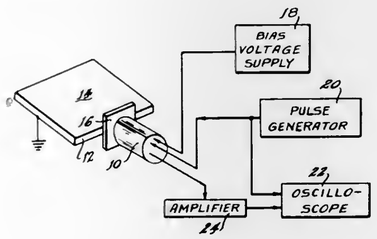
An ultrasonic device for examining the internal parts of the body comprising a plurality of ultrasonic transmitters mounted along a horizontal line on a movable carriage and triggered sequentially. A plurality of receivers is mounted on the carriage along a vertical line that intersects the horizontal line at right angles. The movement of the carriage is synchronized with the deflection of an electron beam in a PPI cathode-ray tube to provide a visual display of the surface contour of the internal body part under investigation.

3,577,773
METHOD AND APPARATUS FOR MEASURING THE PERCENTAGE OF ELONGATION OF METAL STRIPS
Moritada Kubo, Tokyo, and Kuniji Asano, Kawasaki-shi, Japan, assignors to Tokyo Shibawra Electric Co., Ltd., Kawasaki-shi, Japan
Filed Sept. 24, 1969, Ser. No. 860,753
Claims priority, application Japan, Sept. 30, 1968, Oct. 4, 1968, 43/70226;43/71849
Int. Cl. G01n *29/00*
U.S. Cl. 73—67.7 **9 Claims**



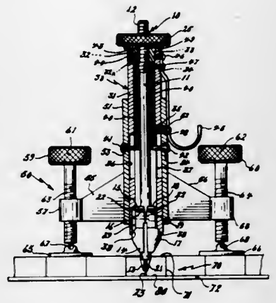
The percentage of elongation of a rolled metal strip is measured by apparatus comprising a plurality of spaced apart magnetic or ultrasonic detectors which are disposed along a line parallel to the direction of movement of the metal strip and not in contact therewith. Signals produced by adjacent pairs of detectors are compared to obtain difference signals which are squared and then added together to provide a signal representing the percentage of elongation of the metal strip.

3,577,774
ELECTROSTATIC ULTRASONIC NONDESTRUCTIVE TESTING DEVICE
Robert W. Steffens, Richland, and Milton F. Zeutschel, Bellevue, Wash., assignee The United States of America as represented by the United States Atomic Energy Commission
Filed Feb. 24, 1969, Ser. No. 801,389
Int. Cl. G01n *29/00*
U.S. Cl. 73—67.8 **1 Claim**



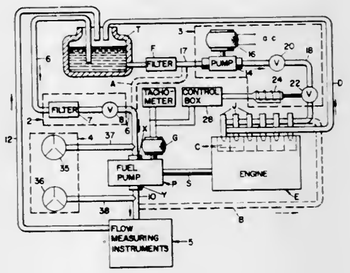
An ultrasonic device for nondestructively testing an electrically conductive sample comprises an electrode mounted to said sample and electrically insulated therefrom. Means are provided for generating a pulsed potential difference between the sample and the electrode to generate an elastic wave in the sample. A bias voltage is applied to the electrode and an oscilloscope is used to detect, relative in time to the applied pulsed potential difference of the electrode, changes in the bias potential of the electrode response to the elastic wave.

3,577,775
BOND LINE TEST TOOL
Albert G. Henderson, Hereford, Md., assignor to The United States of America as represented by the Secretary of the United States Air Force
Filed June 17, 1969, Ser. No. 833,911
Int. Cl. G01n *19/04*
U.S. Cl. 73—95 **2 Claims**



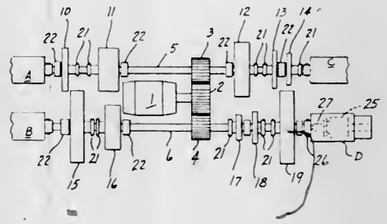
A tool for testing the integrity of a bond line at the interface of the skin and core of a honeycomb panel structure. The tool includes, as major components, means for gripping a wall of a core cell of the honeycomb panel, means for applying a controlled tensile pull to the bond line at the skin-to-core interface by pulling on the gripped core cell wall, and means for supporting and guiding the gripping means and the tensile pull means.

3,577,776
FUEL PUMP TESTING METHOD AND APPARATUS
Thomas J. Brown, Jr., Columbus, Ind., assignor to Cummins Engine Company, Inc., Columbus, Ind.
Filed May 22, 1969, Ser. No. 826,912
Int. Cl. G01m *15/00*
U.S. Cl. 73—119A **7 Claims**



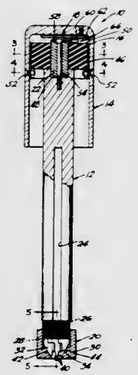
Method and apparatus for testing and calibrating a fuel pump of the type used in "common rail" fuel systems for diesel engines. The fuel pump remains mounted on and driven by the engine. The method involves disconnecting the pump from the injectors, or other fuel delivery means of the engine, and connecting the pump to flow measuring apparatus. The pump remains mounted on and driven by the engine, and the engine in turn receives fuel for its operation from a second fuel pump. An important requirement of the test apparatus is that the pump to be tested must be driven at various controlled speeds. This is accomplished by means for controlling the pressure output of the second fuel pump.

3,577,777
INERTIA SYSTEMS FOR DYNAMOMETERS
Ray W. Whelan, Redwood City, and Edmond J. Atelian, San Carlos, Calif., assignors to Western Gear Corporation, Lynwood, Calif.
Filed Apr. 1, 1969, Ser. No. 812,200
Int. Cl. G01l *5/28*
U.S. Cl. 73—133 **4 Claims**



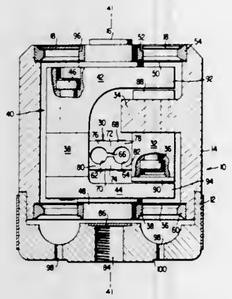
An inertia system for supplying a predetermined amount of energy through a rotating shaft to a dynamometer or like apparatus to permit testing various devices such as brakes. The system includes rotatably supported inertia elements on preferably two shafts connected together by a gear train to permit a substantially infinite variation of inertia and at the same time reduce the required strength of the torque transmitting gearing by employing a connecting gear train.

3,577,778
TORQUE MEASURING TOOL
Gunar Liepins, 1215 Wines Drive, Ann Arbor, Mich.
Filed July 1, 1969, Ser. No. 838,228
Int. Cl. G01l *5/24*
U.S. Cl. 73—139 **9 Claims**



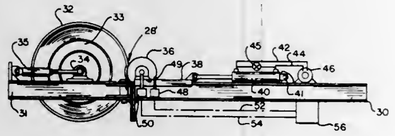
A torque wrench which is particularly adapted for supporting an Allen-type wrench and for indicating the torque that is applied. A shaft is provided on one end of which is mounted a chuck, the shaft being slotted to permit insertion of the Allen-type wrench through the chuck. A hollow transparent plastic handle is connected to the other end of the shaft by an elastomeric coupling, and a torque indicator mechanism extends between the shaft and the handle and is visible through the transparent handle to indicate the torque applied to the Allen-type wrench.

3,577,779
CONSTANT MOMENT BEAM TRANSDUCERS
Eric Laimins, Belmont, Mass., assignor to BLH Electronics Inc., Waltham, Mass.
Filed Mar. 14, 1969, Ser. No. 807,190
Int. Cl. G01l *1/22*
U.S. Cl. 73—141 **5 Claims**



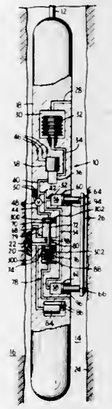
A strain-responsive force transducer includes a constant moment parallelogram-type cantilever-beam unit equipped with strain gages wherein the cantilever-beam unit is held fixed at one end to a support and has a movable end rigidly secured to a force-applying member, guided by spaced diaphragms, the cantilever-beam unit being directly connected between the support and force-applying member without auxiliary flexure provisions and accommodating relative movement between the force-applying member and support with minimum attendant nonlinearities in electrical outputs developed by the strain gages.

3,577,780
METHOD OF MEASURING TIRE UNIFORMITY
Lawrence R. Sperberg, 6740 Fiesta Drive, El Paso, Tex. 79912
Continuation-in-part of application Ser. No. 608,344, Jan. 10, 1967, now Patent No. 3,478,581, dated Nov. 18, 1969. This application Nov. 12, 1969, Ser. No. 875,763
Int. Cl. G01m *17/02*
U.S. Cl. 73—146 **7 Claims**



A tire uniformity machine having means for rotatably mounting a pneumatic tire and a test wheel on an elongated frame and wherein the outer periphery of the test wheel is held adjacent the outer periphery of the tire with a predetermined pressure. The elongated frame is hinged on each side and provided with axially rotatable means to enable the test wheel to be aligned with the buttress area or sidewall of the tire, in addition to the conventional location adjacent the tread. The test wheel is provided with strain gauges and the diameter of the test wheel with respect to the diameter of the tire is held between the limits of 1:30 and 1:4, with the ratio of 1:16 being ideal or optimum.

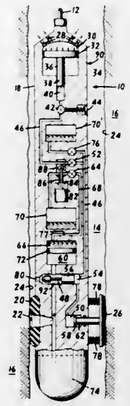
3,577,781
TOOL TO TAKE MULTIPLE FORMATION FLUID PRESSURES
Maurice P. Lebourg, and Roger Q. Fields, Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.
Filed Jan. 10, 1969, Ser. No. 790,321
Int. Cl. E21b *47/06*
U.S. Cl. 73—152 **12 Claims**



A number of pressure readings with respect to fluids in formations traversed by a well bore are obtained in a single traverse of the well bore by a special tool. The tool has a sample chamber comprising one or more compartments for receiving separate samples of formation fluid. The pressure of the fluid in each sample (and hence the pressure of the corresponding fluid in the formation) is measured. In the one-compartment embodiment, fluid is expelled from the compartment after each collection and pressure measurement of a fluid sample. In the two-compartment embodiment, fluid is collected in one compartment and a pressure measurement is made, and fluid previously collected and measured for pressure is expelled. In one embodiment, the samples are expelled into the well bore; in another, into a dump chamber carried in the tool. In embodiments in which the chamber is divided into a large number of compartments, each compartment is used for the collection of only one sample, and the collected samples are not expelled until the tool is recovered.

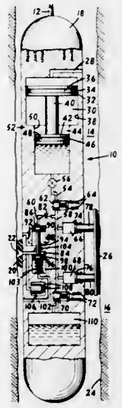
3,577,782
WELL LOGGING TOOL FOR MAKING MULTIPLE PRESSURE TESTS AND FOR BOTTOM HOLE SAMPLING
John Aitken, Paris, France, assignor to Schlumberger Technology Corporation, Houston, Tex.
Filed Jan. 10, 1969, Ser. No. 790,322
Int. Cl. E21b *49/00*
U.S. Cl. 73—155 **13 Claims**

Apparatus is provided for obtaining a plurality of readings with respect to fluids in formations traversed by a well bore. The apparatus includes a housing, annular sealing means for sealing off an area of the wall of the well bore from fluid within the well bore, and formation-fluid-receiving sample chamber means within the housing in communication with sealed-off area of the wall. Gauge means operatively associated with the chamber means is provided for obtaining a reading with respect to fluid within the chamber means, and motive means is provided for bringing the chamber means into cooperation with discrete samples of formation fluid collected at spaced-apart locations in the well bore. In this way, a plurality of readings with respect to fluid in the formations



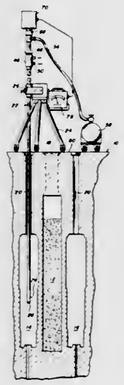
is obtainable in a single traverse of the well bore by the apparatus.

3,577,783
TOOL TO TAKE MULTIPLE FLUID MEASUREMENTS
Frank R. Whitten, and Roger Q. Fields, Houston, Tex., assignors to Schlumberger Technology Corporation, Houston, Tex.
Filed Jan. 10, 1969, Ser. No. 790,199
Int. Cl. E21b *47/06*
U.S. Cl. 73—152 **10 Claims**



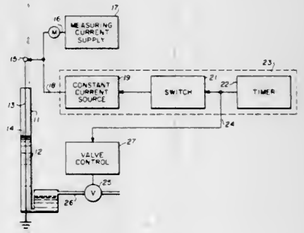
A plurality of readings with respect to fluids in formations traversed by a well bore is obtained in a single traverse of the well bore by a special tool. The tool includes a piston-cylinder assembly having two pistons of differential diameter and serving as a pressure multiplier responsive to the pressure of fluid in the well bore for generating pressure in an operating fluid in a branching conduit in the tool greater than the pressure of the fluid in the well bore at the depth of the tool. Upon opening of a valve in the conduit, the operating fluid sets a shoe against the wall of the well bore and, by reaction, forces annular sealing means on the tool against the wall of the well bore to seal off an area of the wall from fluid in the well bore. After a short delay to permit the setting and sealing, a collection chamber in the tool in communication with the annular sealing means is expanded to reduce the pressure therein and facilitate collection of a fluid sample from the formation. The delay is facilitated by a choke formed in one branch of the conduit and, in one embodiment, by a check valve and a piston-cylinder assembly mounted in the same branch.

3,577,784
METHOD AND APPARATUS FOR MEASURING COKE OVEN FLUE WALL TEMPERATURES
Joseph E. Kovacic, Pittsburgh, Pa., assignor to Koppers Company, Inc.
Filed Dec. 30, 1968, Ser. No. 787,879
Int. Cl. G01j *5/08*
U.S. Cl. 73—355R **10 Claims**



A hollow probe having an angularly positioned reflective surface is inserted through an inspection opening in a coke oven battery roof into an "off" flue. The reflective surface is focused on the flue wall at a preselected elevation and reflects the radiant energy emitted by the flue wall along an unobstructed vertical passageway within the probe to a radiation pyrometer positioned externally of the flue where the flue wall temperature is determined and recorded. The probe includes three concentric cylindrical members. Adjacent the lower end portion of the probe there is an opening in the cylindrical members providing a window for the reflective surface. A coolant is circulated between the outer and intermediate cylindrical members and an inert gas is blown through the central passageway to prevent contamination of the reflective surface.

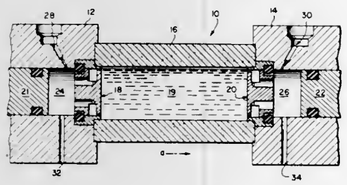
3,577,785
TRANSDUCER CLEANING DEVICE
Lawrence Norayr Guevrekian, Kendall Park, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.J.
Filed June 11, 1969, Ser. No. 832,351
Int. Cl. G01l *9/00*, **G01l** *7/18*
U.S. Cl. 73—398 **5 Claims**



A measuring instrument comprising, in a tube, a column of an electrically conductive liquid having a height which is

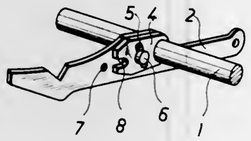
responsive to the input parameter to be measured, an electrical circuit to transform the height of the liquid column into an electrical output value by measuring the voltage drop across the nonimmersed part of a current-carrying wire extending through the tube, and maintaining exact longterm performance of the wire by providing an application of heat thereto thereby preventing contamination of the wire which would otherwise cause nonlinearities between input and output values.

3,577,786
FLUERIC ACCELEROMETER
Albertus E. Schmidlin, Caldwell, N.J., assignor to General Precision Systems, Inc., Little Falls, N.J.
Filed June 25, 1968, Ser. No. 739,882
Int. Cl. G01p *15/02*
U.S. Cl. 73—515 **17 Claims**



A flueric accelerometer comprising a chamber for a nonwetting liquid along with means to pass a pressurized gas through the liquid for detecting differences in hydrostatic pressure of the liquid in response to changes in acceleration of the chamber.

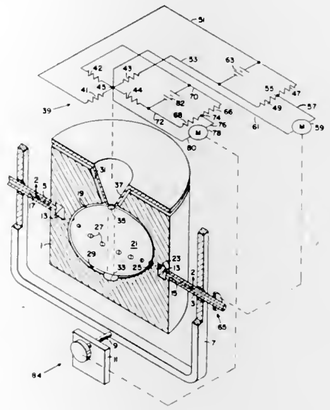
3,577,787
ADJUSTABLE FRICTIONAL CONNECTION
Burkhard Schmidt, and Reinhold Nibbrig, Wilhelmshaven, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany
Filed Nov. 20, 1969, Ser. No. 878,371
Claims priority, application Germany, Nov. 26, 1968, P 18 10 969.8
Int. Cl. G05g *1/04*
U.S. Cl. 74—522 **15 Claims**



Two members having abutting surface portions are pressed into frictional engagement by rivet means so the relative position of the members can be adjusted by overcoming the friction. The adjustment is effected by a tool inserted into a bearing opening of one of the members and effecting displacement of the other member. A rivet passes through a camming slot in one of the members, and through a bore in the other member, and by displacing the rivet in the camming slot, the adjustment is effected. The camming slot is slanted prevents undesired relative adjustment of the two members.

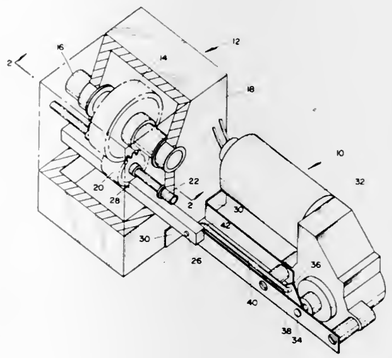
3,577,788
SPHERICAL AIR BEARING GYRO
Friedrich J. Tischer, 2300-M4-Avent Ferry Road, Raleigh, N.C.
Filed Jan. 16, 1969, Ser. No. 791,599
Int. Cl. G01c *19/12*, **G01c** *19/28*
U.S. Cl. 74—5.6 **10 Claims**

A spherical air bearing gyro that is pneumatically actuated and supported as a two-degree-of-freedom gyro. One specie of the invention has a bolometer circuit that is mounted relative to the gyro housing and responds to air blown thereover from an exhaust of the pneumatically actuated gyro. The



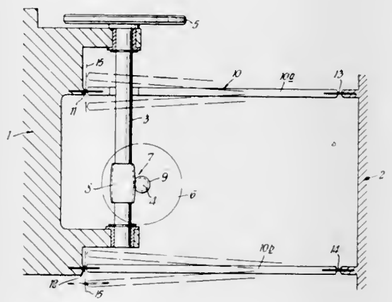
bolometer circuit senses deviations of the gyro rotor and adjusts the gyro housing relative to the gyro rotor to correct deviations.

3,577,789
POWER TAKEOFF ACTUATOR
Claude Sansam, P.O. Box 235, North Land O'Lakes, Wis.
Filed Mar. 19, 1969, Ser. No. 808,549
Int. Cl. F16h *37/100*, **F16h** *21/44*, **F16h** *5/06*
U.S. Cl. 74—11 **9 Claims**



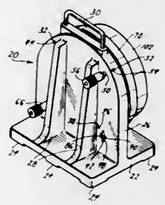
The apparatus includes a rotary reversible electric motor which is energized by the electrical system of a vehicle. The motor has an oscillatable output shaft which carries a radially extending link having an opening in its outer end. A translatable link transmits power between the shaft and a shiftable lever of the power takeoff unit which accomplishes engagement and disengagement of the takeoff unit. The translatable link either rigid or flexible has oppositely offset end portions which engage openings in the radially extending link and shift lever to effect a connection therebetween.

3,577,790
MECHANISMS FOR EFFECTING FINE AND COARSE ADJUSTMENT
Alexander John Munro, Acomb, and John Francis Taplin, Croydon, England, assignors to Vickers Limited, London, England
Filed Oct. 10, 1969, Ser. No. 865,307
Int. Cl. F16h *29/20*
U.S. Cl. 74—89.14 **4 Claims**



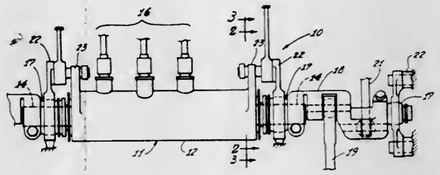
A mechanism for effecting fine and coarse adjustment in which a first member is mounted for movement relatively to a second member. The mechanism includes two substantially mutually perpendicular shafts which are geared together and which are rotatable relatively to each other to effect said movement.

3,577,791
CONTROL SYSTEM
Jan Abraham Vanden Broek, Ann Arbor, Mich., assignor to Conduction Corporation, St. Charles, Mo.
Filed Jan. 22, 1969, Ser. No. 792,949
Int. Cl. F16h *27/02*
U.S. Cl. 74—89.15 **7 Claims**



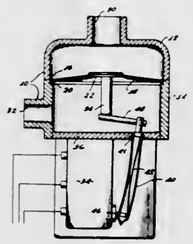
A mount for a optical element has a stationary base, a mounting plate, and four interacting surfaces carried by that base and mounting plate. One of those interacting surfaces provides an essentially fixed spacing between predetermined areas on the base and mounting plate, a second of those interacting surfaces coacts with said one of those interacting surfaces to permit adjustment of the mounting plate relative to the base about one axis, a third of those interacting surfaces coacts with said one of those interacting surfaces to permit adjustment of the mounting plate relative to the base about a second axis, and the fourth of those interacting surfaces coacts with said one of those interacting surfaces to prevent rotation of the mounting plate in its own plane relative to the base.

3,577,792
ROTARY ACTUATOR AND METHOD OF MOUNTING SAME
Earl E. Parks, Los Angeles, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.
Filed Nov. 10, 1969, Ser. No. 875,420
Int. Cl. F16h *21/44*
U.S. Cl. 74—96 **3 Claims**



A rotary actuator and means for installing the same, the latter functioning to arrest axial loads prior to being transmitted to and resisted by the actuator proper and including means permitting the housing of the actuator to "float" or operate in a plurality of positions.

3,577,793
MECHANICAL MOTION TRANSMITTER
Allen V. C. Davis, 5600 Alta Canyada, La Canada, Calif.
Continuation-in-part of application Ser. No. 717,522, Apr. 1, 1968, now abandoned. This application June 30, 1969, Ser. No. 868,660
Int. Cl. F16h *21/44*; **F16j** *15/50*
U.S. Cl. 74—100 **7 Claims**

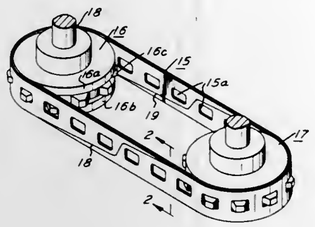


There is disclosed a switch unit having a metal plate forming one wall of a fluid chamber, such plate supporting an electrical switch exteriorly of the chamber. A thin-walled tube is welded at one end in an opening in the metal plate, with the outer end of the tube positioned to actuate the switch plunger. Extending through the tube is a rod having a modulus of elasticity that is greater than that of the tube. A transverse arm on the end of the rod in the chamber is movable by a pressure-responsive element to subject the outer end of the rod, and hence the tube, to transverse operation for actuating the switch plunger.

3,577,794
LAMINATED SPROCKET BELT
Franklin W. Kerfoot, Jr., 678 Andover Road, Newton Square, Pa. 19073
Filed June 17, 1968, Ser. No. 737,541
Int. Cl. F16g *1/26*
U.S. Cl. 74—232 **7 Claims**

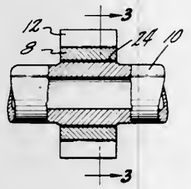
An endless belt for driving sprocket wheels is made of a plurality of layers, each layer having a butt joint which is spaced longitudinally of the belt from the joint of other layers. In one form the length of the joint is at least twice the

width of the belt. The joints pass between adjacent ones of the sprocket holes. Other forms include reinforcing bands



and belts which are thicker in the region between sprocket holes.

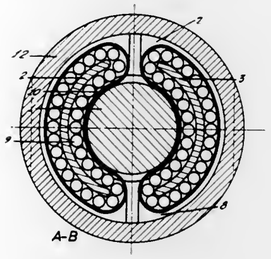
3,577,795
MEANS TO OVERCOME DIFFERENTIAL THERMAL EXPANSION EFFECTS IN BIMETALLIC SPLINED SHAFT ASSEMBLIES
John A. Bennett, Peterborough, England, assignor to Chandler Evans, Inc., West Hartford, Conn.
Filed Oct. 27, 1969, Ser. No. 869,742
Int. Cl. F16h *55/06;* **B21b** *53/28;* **F16d** *1/06*
U.S. Cl. 74—446 **4 Claims**



A steel shaft having peripheral lands is broached by a splined carbide blank to form a broached assembly having interfaces between the lateral flanks of the lands and lateral flanks of the splines. The inner and outer peripheral portions of the steel shaft are spaced from the carbide blank to prevent radial stresses from being produced during broaching and to accommodate thermal expansions in the broached assembly. Circumferential chip grooves are provided in that portion of the shaft which is to be broached by the carbide blank to prevent continuous chips from forming during the broaching process which could seize on the cutting face of the carbide blank. The carbide blank of the broached assembly resists displacements relative to the steel shaft. The interfaces may be angularly disposed to alleviate large circumferential thermal stresses.

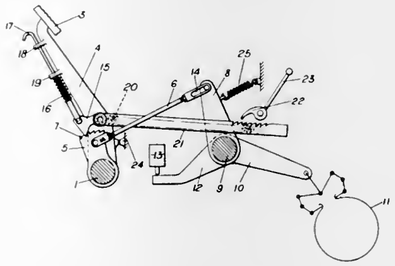
3,577,796
SPINDLE GUIDE
Werner Eissfeldt, Wiesbaden-Rambach, Germany, assignor to Nirona-Werke, Nier & Ehmer KG, Bleidensladt, Germany
Filed Aug. 11, 1969, Ser. No. 848,853
Claims priority, application Germany, Aug. 13, 1968, July 16, 1969, P 17 52 958.7, P 19 36 170.7
Int. Cl. F16h *1/18, 55/22*
U.S. Cl. 74—59 **12 Claims**

An antifriction nut and threaded spindle assembly uses a plurality of continuously recirculating roller bodies traveling through a plurality of individually continuous ways. The ways are positioned sequentially along the axis of the spindle. The ways are each formed by a groove in the nut body and a retainer strip surrounding the groove. That portion of the strip adjacent the spindle fits between the lands of the spindle threads. The nut is split and a clamping ring, whole or split, circumscribes the nut for compressing the nut about the spindle for control of play between the nut and spindle. In one embodiment the nut is formed in two halves having a plurality of the individually continuous ways in each half. The halves (as seen in cross section) may have an inner curvature formed about the axis of the spindle and outer curvature formed about axes spaced from the spindle axis in the direction of the respective nut half. In some embodiments the



roller bodies are each of truncated conical configuration with the small end directed toward the spindle when in operative contact with the spindle. For heavy loads the truncated conical roller bodies meet the lands of the spindle threads in a line contact such that the lines extended, along with the conical axis, meet at a point on the spindle axis. The large end of the truncated conical bodies is concave and in the return portion of the way contact a crown on the portion of the nut defining the return portion of the way.

3,577,797
BRAKING SYSTEM FOR A VEHICLE
Eugenio Todeschini, Reggio Emilia, Italy, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands
Filed June 5, 1969, Ser. No. 830,737
Claims priority, application Italy, June 10, 1968, 17559A/68
Int. Cl. G05g *11/00*
U.S. Cl. 74—479 **1 Claim**

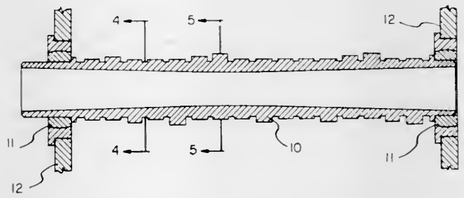


A braking system for a vehicle includes primary powered and secondary mechanical brake actuation means for alternative operation of a brake. The secondary mechanical brake actuation means includes connection means adapted to be adjusted automatically in response to repeated operation of the primary powered brake actuation means. In a preferred embodiment the connection means includes a ratchet and a cooperating pawl for stepwise adjustment of the connection means and a lost motion connection to accommodate free movement within the connection means during operation of the primary powered brake actuation means. When a predetermined amount of brake wear has taken place operation of the primary powered brake actuation means is effective to cause movement between the pawl and the ratchet and adjust the connection means.

3,577,798
HAND BRAKE CONTROL MECHANISMS
Michel Guettier, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt, Hauts de Seine, France and Automobiles Peugeot, Paris, France
Filed Apr. 17, 1969, Ser. No. 817,111
Claims priority, application France, Apr. 22, 1968, 148934
Int. Cl. G05g *1/00*
U.S. Cl. 74—503 **5 Claims**

A handbrake control mechanism having a control member slidably mounted in a slideway guide and connected to the brake control cable. The control member has a tubular body with a handgrip and countergrip at one end, several longitudinal slits, a retaining member constituted by a spring biased pawl pivoted on a pivot pin carried by a shuttle inside the tubular body and operatively connected to the countergrip by a rod. The slideway-guide is cylindrical and has a rack formed along one side to coact with the pawl when the brake is set. A brake cable is connected to the shuttle.

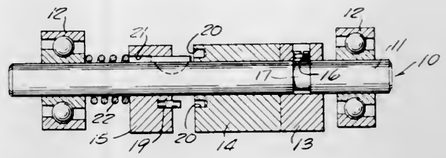
3,577,799
CAMSHAFT
Warren L. Harvey, New Providence, N.J. (P.O. Box 622 West Main St., Mendham, N.J., 07945)
Filed July 1, 1969, Ser. No. 838,097
Int. Cl. F16h *53/02*
U.S. Cl. 74—567 **1 Claim**



A camshaft as used to actuate a plurality of spring returned followers. The camshaft resists the bending loads imposed on it by utilizing a rigid tubular construction in which the inside diameter tapers to a minimum near the center of the length of the camshaft resulting in greater material strength at a section furthest from the bearing support at either end.

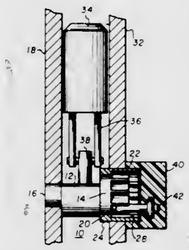
3,577,800
ADJUSTABLE ECCENTRIC
Edwin L. Jones, Brookfield, Wis., assignor to Douglas Dynamics Corporation, Milwaukee, Wis.
Filed Mar. 3, 1969, Ser. No. 803,700
Int. Cl. G05g *1/24*
U.S. Cl. 74—571 **7 Claims**

An eccentric is mounted on a rotatable shaft and includes three axially spaced masses one of which is fixed, another is circumferentially fixed and axially slidable, and a third is adjustable circumferentially. The axially slidable mass holds the third mass in a selected position and is slidable axially to



release the third mass for rotation. The fixed and axially slidable masses have equal and common eccentricities relative to the shaft and the combined masses thereof equals that of the third mass.

3,577,801
LOCKING DEVICE FOR AN ECCENTRIC MEMBER
Louis A. Netta, North Brunswick, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Aug. 25, 1969, Ser. No. 852,642
Int. Cl. G05g *3/00*
U.S. Cl. 74—571 **5 Claims**

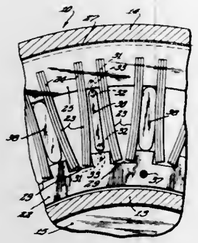


The eccentric locking device comprises an extension on the eccentric itself, a bushing placed about the aperture into which the eccentric is positioned and means for conjointly engaging the bushing and the extension of the eccentric to prevent relative movement therebetween. In a first embodiment a plurality of cavities is placed about the outer surface of the extension and the inner surface of the bushing. A pin is inserted conjointly in the cavities of both in order to prevent relative movement therebetween. In a further embodiment, the extension terminates in a transverse tab; a cap having a slot therein is then inserted atop the bushing's outer surface and the tab is made to engage the slot to thereby prevent relative motion between the bushing and the eccentric.

3,577,802
LEAF SPRING TUNED VISCOUS VIBRATION DAMPER
Rollin Douglas Rumsey, Buffalo, N.Y., assignor to Houdaille Industries, Inc., Buffalo, N.Y.
Filed Mar. 7, 1969, Ser. No. 805,271
Int. Cl. F16f *15/16*
U.S. Cl. 74—574 **16 Claims**

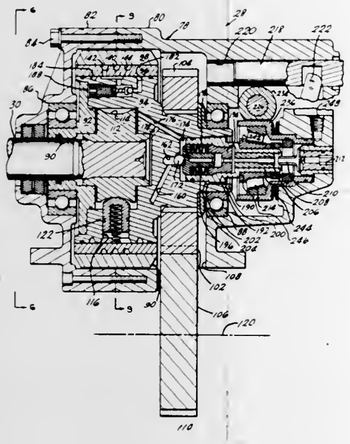
Resilient generally axially extending spokes are anchored at radially outer ends thereof to the radially outer wall within a circular working chamber of a housing, with the radially inner ends of the spokes connected to an inertia mass flywheel for energy absorption, tuned damping of relative oscillatory vibratory motions between the flywheel and the

housing. Relative vibratory oscillations are also resisted by a viscous damping medium coupling between confronting



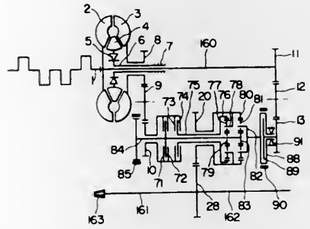
shear film spaced parallel surfaces of the housing and the inertia mass.

3,577,803
VARIABLE TORQUE TRANSMISSION
Otto Mueller, 13 Byfield Lane, Dearborn, Mich.
Filed May 12, 1969, Ser. No. 823,872
Int. Cl. F16h *37/06*
U.S. Cl. 74—665 **9 Claims**



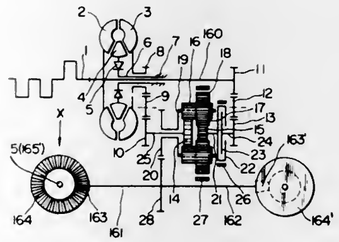
Apparatus for a four or six wheel drive motor vehicle which includes a variable ratio torque transmission assembly connected by drive shafts to front and rear axles. The variable ratio torque transmission assembly has a rotary input member which receives torque from the engine, and first and second rotary output members connected to the front and rear axles respectively. The output members are coupled together by a hydraulic torque transmitting mechanism which includes means for selectively setting the ratio of the input torque that is transmitted to the two output members and thereby to the front and rear axles. This arrangement permits any desired ratio of torque transmission, such as one-third of the torque being transmitted to the front axle and two-thirds of the torque being transmitted to the rear axle. The assembly also includes a remote control means whereby the driver of the vehicle can lock the mechanism between the two output members so that full or maximum torque is transmitted to the front axle.

3,577,804
TORQUE SPLIT TYPE AUTOMATIC SPEED CHANGE DEVICE
Kazuhiko Ohno, and Yoichi Mori, Yohohama, Japan, assignors to Nissan Jidosha Kabushiki Kaisha, Yokohama City, Japan
Division of Ser. No. 640,219, May 22, 1967, Pat. No. 3,455,185.
Filed Mar. 13, 1969, Ser. No. 822,345
Claims priority, application Japan, June 30, 1966, 41/42125
Int. Cl. F16h *47/08*, F16h *37/08*
U.S. Cl. 74—688 **10 Claims**



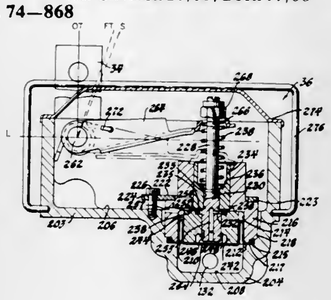
A torque split type automatic speed change device comprising a hydraulic power transmission means having a pump connected to one end of an engine crankshaft and a turbine, a planetary gear assembly disposed in parallel with the axis of the hydraulic power transmission means, a first power transmission route extending between said pump and said planetary gear assembly through suitable transmitting means, and a second power transmission route extending between said turbine and said planetary gear assembly through another transmitting means, thereby powers transmitted to said planetary gear assembly through said two routes are synthesized.

3,577,805
TORQUE SPLIT TYPE AUTOMATIC SPEED CHANGE DEVICE
Kazuhiko Ohno, and Yoichi Mori, Yokohama, Japan, assignors to Nissan Jidosha Kabushiki Kaisha, Yokohama City, Japan
Division of Ser. No. 640,219, May 22, 1967, Pat. No. 3,455,185.
Filed Mar. 13, 1969, Ser. No. 822,346
Claims priority, application Japan, June 30, 1966, 41/42125
Int. Cl. F16h *47/08*, F16h *37/08*
U.S. Cl. 74—688 **5 Claims**



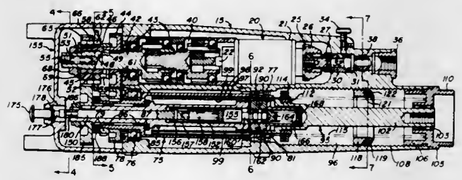
A torque split type automatic speed change device comprising a hydraulic power transmission means having a pump connected to one end of an engine crankshaft and a turbine, a planetary gear assembly disposed in parallel with the axis of the hydraulic power transmission means, a first power transmission route extending between said pump and said planetary gear assembly through suitable transmitting means, and a second power transmission route extending between said turbine and said planetary gear assembly through another transmitting means, thereby powers transmitted to said planetary gear assembly through said two routes are synthesized.

3,577,806
HYDRAULIC MODULATOR VALVE CONTROL
Robert H. Schaefer, Westfield, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 25, 1969, Ser. No. 852,709
Int. Cl. B60k *21/00*, **B60k** *19/00*
U.S. Cl. 74—868 **11 Claims**



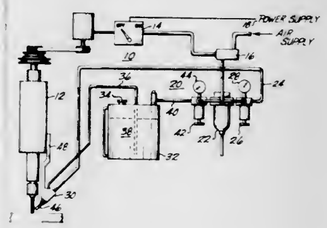
A transmission for an engine having a fuel feed control member movable from zero to full throttle position and an automatic shift control system operative in response to an output governor pressure signal and a torque demand pressure signal for shifting the transmission between low and high speed drives. A force transmitting system for transmitting a force proportional to torque demand position having a pair of expansible chambers interconnected by a fluid passage filled with fluid and each chamber having a movable wall. A spring positioned between said movable torque demand member and one movable wall generates a force proportional to torque demand position on the one movable wall so the system pressure is proportional to torque demand and the system transmits to the other movable wall a force proportional to the position of the torque demand member without significant fluid movement in the system. The other movable wall actuates a regulator valve to provide a torque demand pressure proportional to the position of said torque demand member which functions with a governor pressure to control the automatic shift valves.

3,577,807
PORTABLE POWER TOOL
Robert H. Alexander; Ronald C. Falter; Cecil D. Ringer, Columbia, S.C., and Eugene Linsker, Dayton, Ohio, assignors to Rockwell Manufacturing Company, Columbia, S.C.
Filed Oct. 31, 1968, Ser. No. 772,132
Int. Cl. B23b *45/14*
U.S. Cl. 408—17 **22 Claims**



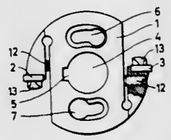
A portable tool incorporates an air motor which drives a tubular drive shaft splined to a spindle movable axially in a direction parallel to the axis of the motor. The spindle has a hollow rearward end portion with internal threads which receive screw members mounted on a tubular feed shaft also driven by the motor through an adjustable detent clutch. An adjustable stop collar surrounds the spindle and provides precise depth control, an air cylinder provides rapid advancement of the spindle, and the clutch provides automatic disengagement of the positive feed as well as limited rotation of the spindle at the forward end of the feed stroke before the spindle retracts. The controls for adjusting the stop collar and for effecting positive feed and rapid advancement and retraction of the spindle are located at the rear of the tool.

3,577,808
SUB-ZERO CUTTING FLUID GENERATOR
Gerrit A. Visser, Edmonds, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Dec. 13, 1968, Ser. No. 785,964
Int. Cl. B23b *47/00*
U.S. Cl. 408—61 **2 Claims**



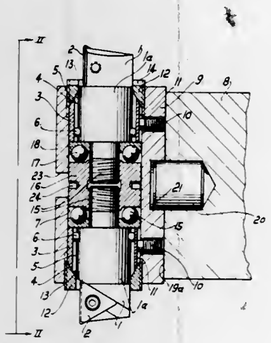
This cutting fluid generator comprises a variety of components connected and arranged so that an improved method for applying cutting fluids (consisting of a coolant-lubricant mixture) through an external mist delivery to drills is obtained. Pressurized, dry, clean air is delivered to a mixing station provided with a venturi which increases the speed of the air via a suction chamber connected to the cutting fluid supply. The cutting fluid is micronized and intermixed into the airstream by vacuum suction of the passing air and the micronized cutting fluid will instantaneously evaporate in the mist projected onto the drill and workpiece, which will result in thorough lubrication and a −26° F. cooling.

3,577,809
QUICKSET TOOLHOLDER
Walter Brandl, Bad Homburg vor der Hohe, and Rudolf Mathes, Niedereschbach, Germany, assignors to Reimers Getriebe A. G., Zug, Switzerland
Filed Aug. 22, 1968, Ser. No. 754,612
Claims priority, application Germany, Aug. 30, 1967, P 16 02 941.7
Int. Cl. B23b *29/034*
U.S. Cl. 77—58 **2 Claims**



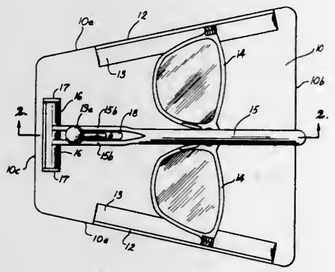
A toolholder for holding cutting tools is provided with a standard cone at its rear end for insertion into a machine tool. The front end consists of an axially projecting stud. Disc-shaped tool carriers are provided with a central bore and further with means for receiving and holding at least one cutting tool. By means of their bore, the tool carriers are arranged on the stud to which they are positively secured by clamping means, for example, by a bayonet coupling. The distance between the nose of the cutting tools and the rear surface of the tool carriers is at all carriers set to a uniform predetermined range, thereby avoiding any shifting of the zero-point when one tool carrier is exchanged for another one.

3,577,810
BORING BAR INSERT
Otto Eckle, Lochgau, Germany, assignor to Firma Komet Stahlhalter-Und Werkzeugfabrik, Robert Breuning-G.m.b.H., Neckar, Germany
Filed Mar. 12, 1969, Ser. No. 806,572
Claims priority, application Germany, Mar. 20, 1968, P 17 52 014.8, P 17 52 012.6
Int. Cl. B23b *29/034*
U.S. Cl. 77—58 **8 Claims**



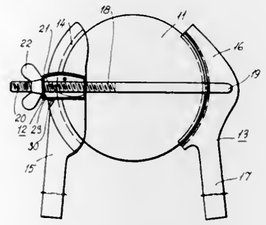
A boring bar insert having two counterwise movable boring tool carriers, the tools of which are arranged at oppositely actuated ends of the boring tool carriers when rotated through 180° to one another. For counterwise movement and adjustment of the boring tool carriers there is between their mutually facing shank ends an adjusting ring cooperating with two counterwise screwthreads of the boring tool carriers and a centering device. The boring tool holders are securely held and also can be moved counterwise in the clamped condition. Centering of the boring tool carriers with respect to the boring bar axis is possible.

3,577,811
DEVICE FOR RETENSIONING EYEGLASS FRAMES
Ambrose D. Walker, Clinton, Mo., assignor to Leo X. O'Brien, Independence, Mo., fractional part interest
Filed Dec. 12, 1968, Ser. No. 783,338
Int. Cl. B25b *11/00*
U.S. Cl. 81—3.5 **8 Claims**



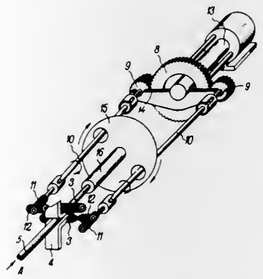
This invention has to do with a retensioning device for eyeglass frames and is adaptive for use on different sized frames. The retensioner employs a pressure lever pivoted centrally upon its base remote from the nosepiece of the glasses to permit the free end of the pressure lever to nest in the nosepiece curvature, and a tensioning assembly for manually imposing and maintaining for desired intervals an adjusted downward pressure on the nosepiece and frame.

3,577,812
OPENING DEVICE FOR CANS AND SIMILAR CONTAINERS PROVIDED WITH TWIST LIDS
Ivar Alvar Asp, Storbergsliden 15, Sollentuna, Sweden
Filed May 31, 1968, Ser. No. 733,478
Claims priority, application Sweden, June 5, 1967, 7864/1967
Int. Cl. B67b *7/18;* **B25b** *13/48*
U.S. Cl. 81—3.36 **4 Claims**



An opener in the form of a pair of tongs for cans, jars and similar containers provided with twist lids, which includes two leg members presenting handle portions and jaw portions, wherein one jaw portion is adapted to be applied to the surface of the container, while the other is brought to bear against the lid, and wherein the leg members are so connected that slight pressure on the handle members causes the lid to rotate relative to the body of the container.

3,577,813
DEVICE FOR STRIPPING OUT SHIELDING SHEATH
Evgeny Nikolavevich Vorontsov, Blagodatnaya ulitsa, 25, kv. 45, Leningrad, U.S.S.R.
Filed Apr. 9, 1969, Ser. No. 814,573
Int. Cl. H02g *1/12*
U.S. Cl. 81—9.51 **1 Claim**

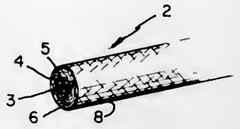


A device for stripping shielding sheath or insulation from the ends of wires or cables, in which two diametrically opposite cutting members each of which constitutes a milling cutter adapted to rotate in the direction of the wire feed coact with a blade fixed in position with respect to the cutter to provide shears to sever the shielding sheath or insulation.

3,577,814
APPARATUS FOR EXPOSING CORE OF AN INSULATED WIRE
James Woodrow Hammond, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Aug. 28, 1969, Ser. No. 853,816
Int. Cl. H02q *1/12*
U.S. Cl. 81—9.51 **7 Claims**

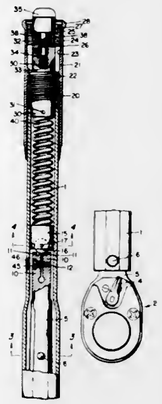
Apparatus for exposing the conducting core of an insulated wire comprises a pair of jaws movable relatively towards and away from each other between open and closed positions. Clamping means are provided on the corresponding ends of

the jaws to clamp a wire extending between the jaws when the jaws are closed. The portion of the wire which extends between the jaws is loosely confined against substantial lateral flexure. Insulation pushing fingers mounted in the jaws



are adapted to grip the insulation adjacent to the end of the wire and push it towards the clamping means. The insulation is bunched or compressed between the fingers and the clamping means and the end portion of the wire core which is thereby exposed for application of an electrical terminal.

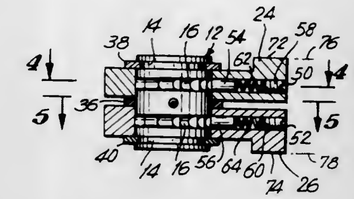
3,577,815
TWO-WAY TORQUE WRENCH
Clifford A. Bergquist, Alhambra, Calif., assignor to Pendleton Tool Industries, Inc., Los Angeles, Calif.
Filed Apr. 2, 1969, Ser. No. 812,605
Int. Cl. B25b *13/46*
U.S. Cl. 81—52.4 **11 Claims**



A predetermined torque release wrench which may be used to apply a torque to a fastener in either rotary direction. The wrench includes an arm connected to the ratchet head of the wrench and a spring pressed cam and follower arrangement. The arm overcomes the resistance of the cam and follower arrangement when a predetermined torque is reached. An arrangement is provided for varying the profile of the cam to permit calibration of the wrench.

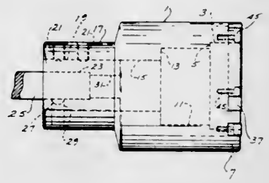
3,577,816
RATCHET WRENCH
Jerry Alexander, 64 Hedgerow Lane, Jericho, N.Y., and Irving J. Stevens, 130 Margaret Blvd., Merrick, N.Y.
Filed Apr. 10, 1969, Ser. No. 815,074
Int. Cl. B25b *13/46*
U.S. Cl. 81—63.1 **10 Claims**

A ratchet type wrench wherein a pair of swingable handles swing around a ratchet and have a pair of pawls which respectively coact with the ratchet to turn the latter in one direction with respect to one handle when the other handle is turned in a given direction and prevents backlash while providing positive ratcheting both forward and reverse without friction applied to the wrench. The wrench is of a relatively small size and is extremely thin so that it is capable of being used where only a small operating space is afforded. A very small radius of arc is required to effect a ratchet movement. The pair of handles are relatively thin and are maintained close to each other with these handles respectively having outer exterior side surfaces directed away from each other and respectively located substantially in planes normal to the axis of the rotary ratchet. The distance between these planes is actually the maximum thickness of the entire wrench. One handle is used for stabilizing the



wrench, and the other is used for driving the ratchet. In addition, the entire wrench is composed of components which require no lubrication for effective operation and which can be sterilized without suffering any deleterious effects, so that the wrench lends itself to medical uses such as, for example, in connection with dental operations.

3,577,817
SOCKET WRENCH
Kave A. Smith, Jennings, and Henry L. Ladendecker, St. Louis, Mo., assignors to McNeil Corporation, Akron, Ohio
Filed Aug. 25, 1969, Ser. No. 852,712
Int. Cl. B25b *13/06,* **B25b** *13/00*
U.S. Cl. 81—121 **9 Claims**

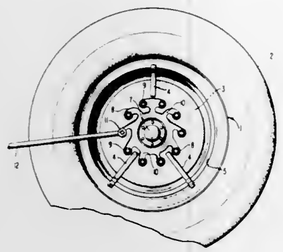


A socket wrench is formed as a barrel having an end in which is a circular opening. The opening is of an internal diameter approximately equal to the distance across the corners of a hexagonal nut. Said end is grooved crosswise at 120° intervals. In each groove is removably fastened a bar made of wear-resistant tool-steel bar stock of square cross section chamfered on one corner. The inner flat faces of these bars bridge across said opening for flatwise engagement with every other flat face of the hexagonal nut. The segments of said circular opening between bars extend clear of the sides of the nut which are not engaged by the bars. Under the opening and the bridging bars the barrel has an internal shoulder which is engageable with the corners of the nut to determine the axial positions of the bars on the nut. The other end of the barrel is provided with an adapter for coupling to a rotary power driving element.

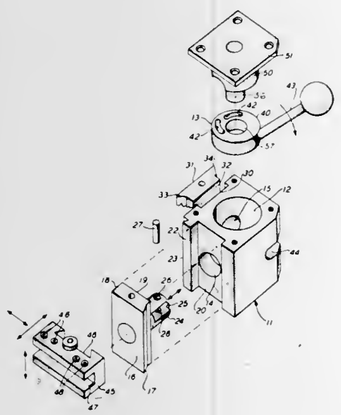
3,577,818
LUG WRENCH SUPPORT
Leslie Dick Cramer, 888 Amoretti St., and John R. Moore, 558 Lincoln St., P.O. Box 765, Lander, Wyo.
Filed Sept. 25, 1969, Ser. No. 861,070
Int. Cl. B25b *13/58*
U.S. Cl. 81—180 **8 Claims**

A wheel nut wrench support for use in the removal of wheels from a vehicle, particularly in connection with trucks and similarly heavy-duty vehicles, including a plate member provided with a plurality of slotted apertures distributed in an annular pattern thereon and provided additionally with multiple elements extending radially from the plate member and adapted to engage a wheel rim to support the plate member in spaced relationship with the wheel in an orientation substantially parallel to the plane of the wheel wherein the plu-

rality of apertures are aligned axially with the plurality of wheel lugs. According to a modification of the present invention, at least one of the support elements is adjustable in length, thereby rendering the plate member useful in conjunction with wheels of different radial dimensions.



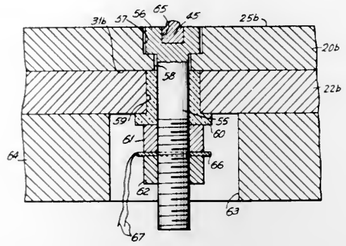
3,577,819
TOOLPOST
Hans Scheideler, 7100 Boulevard East, Guttenberg, N.J.
Filed Sept. 5, 1969, Ser. No. 855,616
Int. Cl. B23b *29/26*
U.S. Cl. 82—37 **6 Claims**



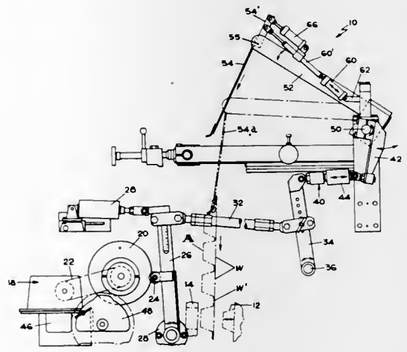
A toolpost wherein a clamp for a toolholder is moved into gripping relation with the toolholder by a rotatable disc with an arcuate cam slot, that moves the clamp; the slot disposed eccentrically with the axis of rotation of the cam.

3,577,820
DIE FOR SEALING OR CUTTING THERMOPLASTIC MATERIAL
Paul Silverstein, Jamaica, N.Y., assignor to Applied Synthetics Corp., East St. Louis, Ill.
Filed Oct. 25, 1968, Ser. No. 770,654
Int. Cl. B26d *7/10*
U.S. Cl. 83—171 **5 Claims**

A pair of die plates of insulating material, clamped in facing engagement, are routed to form grooves, the groove of one plate being greater in width than the groove of the other plate. Heated die means are then mounted in the grooves.

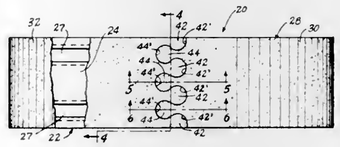


3,577,821
TRIM PRESS ASSEMBLY
Roger L. Medendorp, Grand Rapids, Mich., assignor to Kirkhof Manufacturing Corporation, Grand Rapids, Mich.
Filed Jan. 21, 1969, Ser. No. 792,618
Int. Cl. B65h *17/18*
U.S. Cl. 83—238 **4 Claims**



Advancing apparatus for a trim press of articles formed into a web in repeat patterns, having a reciprocating pusher that has a regular stroke length, and periodically has a greater stroke length by reason of actuation of a special fluid cylinder that in one form of the invention forms a component of the connecting linkage from the power drive to the pusher, and in a second form of the invention, is attached to an extensible portion on the pusher.

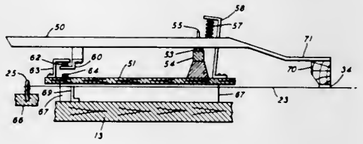
3,577,822
REMOVABLE FREEWHEELING RESILIENT COVER FOR ROTARY ANVIL
Louis E. Sauer, and Robert W. Sauer, St. Louis, Mo., assignors to Centenary Central, Inc., St. Louis, Mo.
Filed Apr. 16, 1969, Ser. No. 816,657
Int. Cl. B26d *7/20*
U.S. Cl. 83—659 **13 Claims**



This is a freewheeling resilient rotary diecutting anvil cover comprising a flexible member of one or multiple pieces

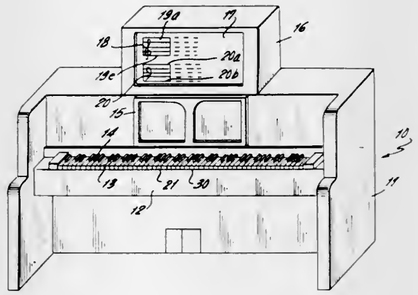
releasably secured together along a generally axial line or lines including one or more annular ribs on the inner surface for disposition in annular grooves in the cylindrical supporting base in which at least the portions of the rib or ribs leading to the releasable connection or connections are of split T-cross section and collapsible to relieve binding and to permit installation and removal from a head, or the like, without removing the head. In a modification, a cover lengthened by use can be cut to smaller size. Another modification employs a metal plate or plates to reduce lengthening.

3,577,823
ACTUATOR FOR STRINGED MUSICAL INSTRUMENT
Leonard W. Pavia, 460 Columbia Turnpike, Florham Park, N.J.
Filed Apr. 15, 1969, Ser. No. 816,198
Int. Cl. G01c *1/00;* **G10c** *1/06;* **G10d** *3/16*
U.S. Cl. 84—174 **3 Claims**



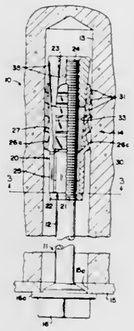
I disclose an actuator or vibrator for a keyboard stringed musical instrument wherein the string is vibrated by adhesion of the string to the actuator. The adhesive effect is obtained by mixing a glazing paste of permanent flexibility in a solvent, absorbing the mixture through a felt damping pad so that it is fully impregnated, then evaporating the solvent, and affixing the thus-impregnated felt pad onto a body portion of the actuator. The glazing paste consists of an inert material, such as talcum, dispersed in a nondrying soft wax, such as a polyamide, plasticized polyethylene wax, or a soft wax of natural origin which also contains a small amount of water to obtain the proper consistency and workability.

3,577,824
MUSIC TEACHING MACHINE
Lawrence P. Lavan, 245 E. 72nd St., New York, N.Y.
Filed May 13, 1969, Ser. No. 824,111
Int. Cl. G09b *15/02*
U.S. Cl. 84—478 **7 Claims**



A music teaching machine produces small lighted areas on a screen having musical notations in response to depressions of the keys of an associated musical instrument. The lights are color coded and physically positioned to indicate the sets of notes constituting major thirds and minor thirds. A movie picture projector, lens system, and a mirror are arranged to project notes, to be played, on the same screen.

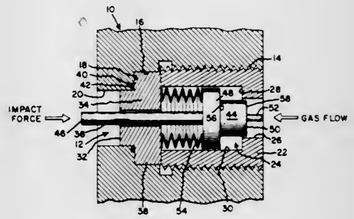
3,577,825
BOLT ANCHOR AND METHOD FOR MAKING SAME
Hans E. Reusser, Cleveland, Ohio, assignor to Republic Steel Corporation, Cleveland, Ohio
Filed Nov. 30, 1967, Ser. No. 687,052
Int. Cl. F16b *13/06*
U.S. Cl. 85—76 **34 Claims**



An anchor assembly particularly adapted for use with a roof plate to support a mine roof. The assembly includes a bolt having a threaded end, a camming plug threaded on the bolt, and an expansion shell. The disclosed shell structure includes a polygonal, tubular collar portion and a plurality of fingers projecting longitudinally from the collar. In use, the fingers frictionally engage the camming plug. The fingers include a plurality of cold formed teeth which have an increasing depth and pitch proceeding along the fingers toward the collar and which are, when the assembly is installed, urged into engagement with the walls of a bore hole upon rotation of the bolt to move the camming plug toward the collar and cam the fingers into engagement with the bore.

One disclosed embodiment is provided with a wirelike bail member having a portion extending over the end of the bolt and end portions engaging shoulders formed on the expansion shell so that the unexpanded shell and the plugs are maintained in assembled position for insertion into the bore. The bail member maintains the camming plug and shell assembled until the shell has been partially expanded, after which the bail member is yielded in a manner which does not impede anchoring of the assembly in the bore or tensioning of the bolt.

3,577,826
BELLOWS SEALED FIRING PIN
Eugene Ashley, Burlington, and Douglas Pray Tassie, St. George, Vt., assignors to General Electric Company
Filed July 22, 1969, Ser. No. 843,728
Int. Cl. F41f *11/00*
U.S. Cl. 89—26 **12 Claims**

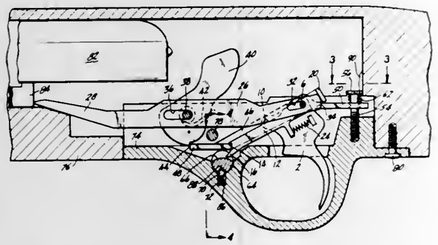


A firing pin bolt assembly includes a tubular bellows having one end sealed to and about the penetrator end and its other end sealed to the bolt about the firing pin passageway.

3,577,827
TRIGGER MECHANISM

William J. Billett, Fairmont, Minn., and Edwin S. Vartanian, North Haven, Conn., assignors to Olin Mathieson Chemical Corporation

Filed Jan. 27, 1969, Ser. No. 793,958
Int. Cl. F41c *19/00*
U.S. Cl. 89—145 11 Claims

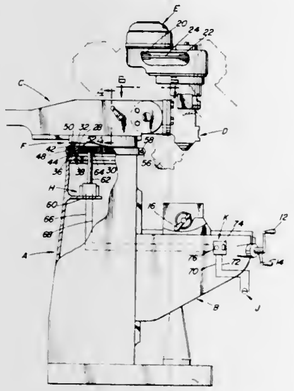


A trigger mechanism for a semiautomatic firearm having a reciprocating bolt assembly, the mechanism having a trigger member which is releasably connected to a sear member. The trigger member is disconnected from the sear by reciprocation of the bolt assembly or by actuation of a safety. Means are provided for adjusting the trigger pull and for retaining the preset trigger pull against maladjustment.

3,577,828
MILLING MACHINE

Leslie P. Stickney, Portland, Maine, assignor to Gulf & Western Precision Engineering Company, Manchester, Conn.

Filed Apr. 17, 1969, Ser. No. 817,049
Int. Cl. B23c *1/12*
U.S. Cl. 90—15 1 Claim

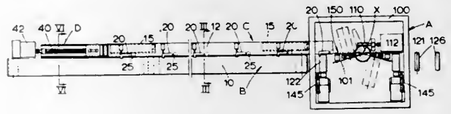


A milling machine includes a substantially vertical support having a machine head attached thereto. The machine head extends horizontally from the vertical support and includes a mounting portion which is rotatably attached to the vertical support. An electric motor mounted in the vertical support drives a ring gear on the machine head to rotate the machine head about a substantially vertical axis. The machine head includes a tool spindle. Rotational movement of the machine head moves the tool spindle in an arcuate path so that arcuate shapes may be machined. The tool spindle is preferably pivotally attached to the machine head so that sloping arcuate surfaces may be machined.

3,577,829
METHOD AND APPARATUS FOR CUTTING COMPONENTS TO LENGTH

James Hurn, Rowley, Melksham, Wiltshire; Charles Richard Forbes King, 6 Somerset Lane, and Donald Raymond Deane, Foxhall Farm, Weston, Bath, Somerset, England

Filed Sept. 6, 1968, Ser. No. 757,912
Claims priority, application Great Britain, Sept. 13, 1967, 41799/67
Int. Cl. B23c *9/00*; B26d *7/16*; B27b *5/18*
U.S. Cl. 90—21R 17 Claims

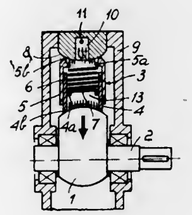


Apparatus and method for positioning an elongate workpiece so that it may be worked, e.g. by cutting, sawing, drilling, trenching or shearing, at any preselected point along its length, including the steps of passing the workpiece from a working tool on a longitudinal conveyor; selecting a stop from a plurality of such stops which are serially spaced from said working tool over at least part of the length of the conveyor; adjusting the longitudinal position relative to the conveyor and to the working tool of a common structure carrying said stops, the distances between the stops being uniform, and placing said selected stop in the path of the workpiece to arrest its further progress on the conveyor. Pneumatic cushioning means are interposed between the common structure and the means for adjusting the common structure. The cushioning means are employed to absorb impact by allowing limited movement to the common structure when the workpiece abuts the selected stop, and then to reverse the said movement of the common structure to reposition the stop and hence to bring the preselected location of the workpiece opposite the working tool.

3,577,830
HYDRAULIC MOTOR

Aurelio Ortelli, Bologna, Italy, assignor to Riva Calzoni S.P.A., Milan, Italy

Filed Sept. 26, 1968, Ser. No. 762,885
Claims priority, application Italy, Sept. 29, 1967, 21059A
Int. Cl. F01b *15/00*
U.S. Cl. 92—66 4 Claims

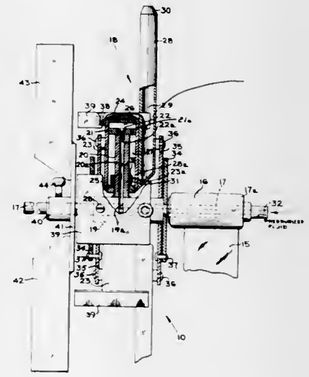


A hydraulic motor with radial propelling members, which includes a shaft provided with a cam with a spherical surface, around which a plurality of radial propelling members is arranged and in which each of said propelling members is composed of a tubular element of telescopic form attached to resilient means which initially maintain one end of said tubular element in contact with the spherical surface of the cam and maintain the other end of said tubular element in contact with a cap or a fixed striker with a spherical surface, the chamber defined by the said tubular element being in alternate communication with a source of compressed fluid and with a discharge line.

3,577,831
POSITIONING DEVICE WITH AUTOMATIC RETURN STROKE

Charles L. Brinkman, 3118 Atherton Road, Dayton, Ohio

Division of Ser. No. 515,260, Dec. 20, 1965, Pat. No. 3,302,902. Continuation-in-part of Ser. No. 608,523, Jan. 11, 1967, abandoned, continuation-in-part of application Ser. No. 228,866, Oct. 8, 1962, now Patent No. 3,228,624. This application June 27, 1969, Ser. No. 837,264
Int. Cl. F01b *15/02*; F15b *15/17*
U.S. Cl. 92—66 4 Claims

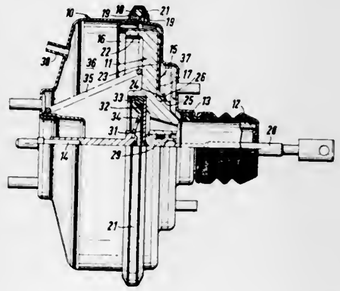


A positioning device comprises a plurality of positioning elements each having relatively movable piston and cylinder elements with restricted fluid communication between both ends of the cylinder element. Each of the relatively movable piston and cylinder elements is angularly disposed relative to other such elements which are structurally interconnected with a floating equalizer linkage to provide uniform and unrestricted movement within desired limits. Pressurized fluid is supplied to the cylinders through internal passageways to cause relative movement in one direction and the device automatically returns to its initial position when disconnected from the supply of pressurized fluid.

3,577,832
FLUID PRESSURE OPERATED SERVO DEVICES

David Parsons, Warwickshire, England, assignor to Automotive Products Company Limited, Warwickshire, England

Filed Dec. 30, 1968, Ser. No. 792,199
Claims priority, application Great Britain, Jan. 12, 1968, 1985/68
Int. Cl. F16j *3/00*
U.S. Cl. 92—98 2 Claims

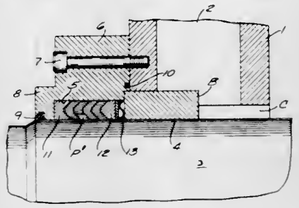


A flexible diaphragm providing a fluidtight partition between chambers in a fluid servomotor casing is held against movement of its inner edge away from a rigid member axially movable in the casing by a washer mounted on a cylindrical surface of said rigid member to form, with an annular surface on said member, a radially outwardly convergent channel enclosing a bead on that edge of the diaphragm.

3,577,833
FLUID CYLINDER

Darold M. Skelton, Brookfield, Wis., assignor to Milwaukee Cylinder Corporation, Cudahy, Wis.

Filed July 11, 1969, Ser. No. 841,018
Int. Cl. F16j *15/16, 15/18*
U.S. Cl. 92—168 3 Claims

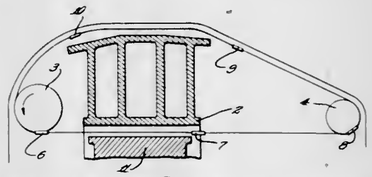


A fluid cylinder having an end cap and a retainer plate for the end cap for containing packing thereby permitting a simplified bushing to be inserted in the end cap insuring that the entire bearing surface of the bushing is lubricated.

3,577,834
GRIPPER BAR MOUNT FOR PLATEN PRESS

Pierre Lang, Vaud, Switzerland, assignor to J. Bobst & Fils S. A., Lausanne, Switzerland

Filed Dec. 9, 1968, Ser. No. 782,191
Claims priority, application Switzerland, Dec. 11, 1967, 17445/67
Int. Cl. B31b *1/20, 17/02*; B65g *17/14*
U.S. Cl. 93—58.3 14 Claims

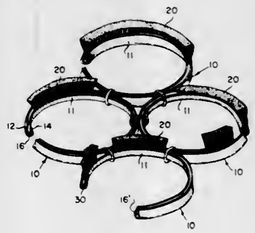


A device for accurately centering the gripper bars carried by a pair of endless chains, in a desired working position in a press. Gripper bars are rigidly secured at their opposite ends to the endless chains during movement of the chains and when chain movement stops, the gripper bars are released from the chains for limited freedom of movement and means then cooperate with the freed gripper bars to positively accurately center the bars.

3,577,835
SKI MAT APPARATUS

John P. Horton, Bernardsville; Robert E. Sollmann, Far Hills, and Joaquim L. Santos, Harrison, N.J., assignors to Ski-Mor Inc., Kenilworth, N.J.

Continuation of application Ser. No. 536,402, Mar. 22, 1966, now abandoned. This application Jan. 17, 1969, Ser. No. 792,909
Int. Cl. E01c *5/00*
U.S. Cl. 94—3 8 Claims



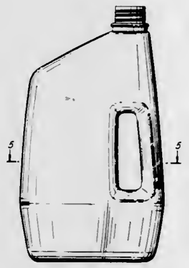
Sliding surfaces having a plurality of annular, rigid strips with bristles extending uniformly upward, the strips being interconnected to form a continuous surface of upward directed bristles in annular rings, are described herein.

DESIGNS

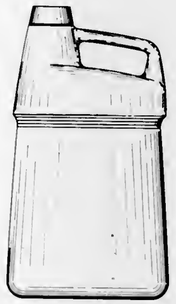
MAY 4, 1971

220,608
NECKTIE OR THE LIKE
Louis J. Schultze, 102 E. Oak St.,
Chicago, Ill. 60611
Continuation-in-part of design application Ser. No. 19,239, Sept. 22, 1969. This application July 29, 1970, Ser. No. 24,213
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—351

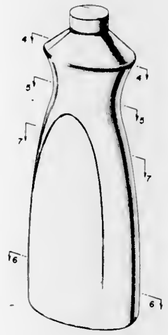
220,609
JUG OR SIMILAR ARTICLE
Michael Clement Dickins, Bletchley, England, assignor to Plysu Containers Limited, Bletchley, England
Filed Oct. 20, 1969, Ser. No. 19,624
Claims priority, application Great Britain June 23, 1969
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—43



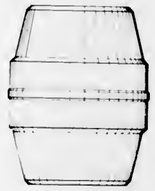
220,610
JUG
David G. Hills, Collinsville, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Dec. 30, 1968, Ser. No. 15,137
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—48



220,611
BOTTLE
David G. Hills, Collinsville, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Oct. 28, 1968, Ser. No. 14,188
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—117

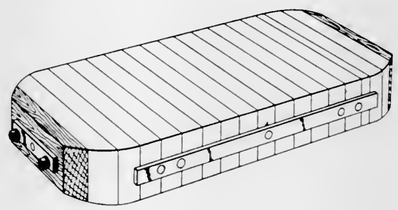


220,612
BEER CAN
Kenneth E. Siegler, 1004 S. Pine St.,
Port Angeles, Wash. 98362
Filed Apr. 20, 1970, Ser. No. 22,519
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—216

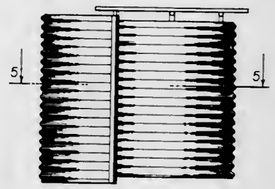


220,613
AEROSOL ACTUATING BUTTON PROTECTOR
Theodore Andrew Beck, Andover, Mass., assignor to Scovill Manufacturing Company, Waterbury, Conn.
Filed Feb. 19, 1970, Ser. No. 21,518
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—258

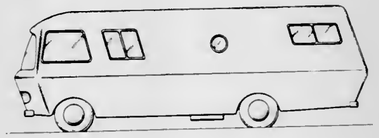
220,614
CUTTING BLOCK
Leonard K. Reichert, 16 Euston St.,
Brookline, Mass. 02146
Filed Dec. 12, 1969, Ser. No. 20,476
Term of patent 14 years
Int. Cl. D15—*12*
U.S. Cl. D11—1



220,615
PORTABLE OUTHOUSE
William L. Thompson, Pueblo Mountain Park,
Beulah, Colo. 81023
Filed Mar. 3, 1970, Ser. No. 21,709
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1

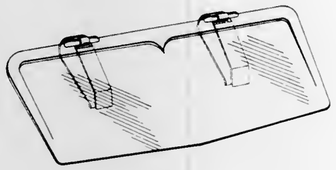


220,616
MOTOR HOME
Gerald D. Schwartz, Van Nuys, Calif., assignor to United Bus Sales, Inc., Bell Gardens, Calif.
Filed Oct. 17, 1969, Ser. No. 19,603
Term of patent 7 years
Int. Cl. D12—*09*
U.S. Cl. D14—3

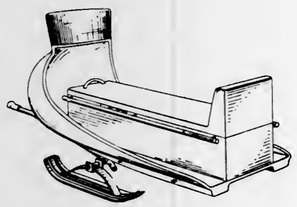


220,617
REMOVABLE LIFT FORK FOR LOADER AND BACK HOE BUCKETS AND THE LIKE
John R. Pavese, 771 Rivervale Road,
River Vale, N.J. 07675
Filed Dec. 22, 1969, Ser. No. 20,756
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—3

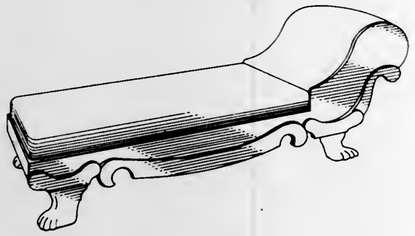
220,618
AUTOMOBILE SUN VISOR
Daniel A. Berkoff, Sherman Oaks, Calif., assignor to Hollywood Accessories, a division of Orion Industries, Inc.
Filed May 11, 1970, Ser. No. 22,932
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D14—6



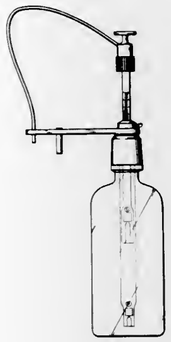
220,619
SNOWMOBILE TRAILER
Ernest W. Rowley, 131 Wendell Ave., Weston, Ontario, Canada
Filed Mar. 23, 1970, Ser. No. 22,337
Claims priority, application Canada Sept. 24, 1969
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D14—24



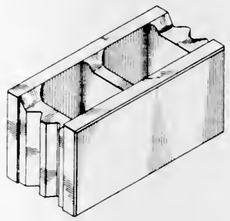
220,620
LOUNGE
Eugene F. Jones, 941 Reed Ave., East Point, Ga. 30344
Filed Dec. 17, 1969, Ser. No. 20,528
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—11



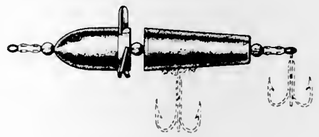
220,621
MEASURED-VOLUME DISPENSER FOR CHEMICAL REAGENTS OR THE LIKE
John J. Moran and Robert C. Querry, Houston, Tex., assignors to Hycel, Inc., Houston, Tex.
Filed Jan. 5, 1970, Ser. No. 20,759
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D16—1



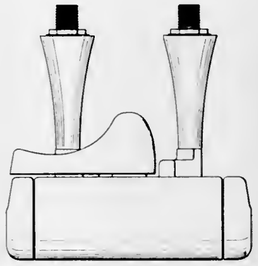
220,622
MODULAR BUILDING BLOCK UNIT
Robert J. Passander, Indianapolis, Ind., assignor to Intercom Research, Inc., Indianapolis, Ind.
Filed Dec. 15, 1969, Ser. No. 20,650
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D18—2

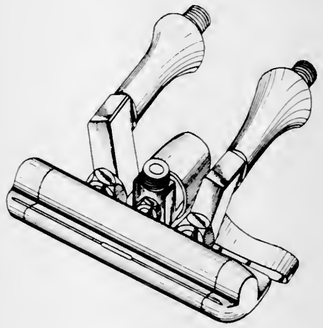


220,623
FISH LURE
Fred L. Churchman, 2820 Alaska St., Baton Rouge, La. 70803, and Garney B. Glasgow and Max A. Glasgow, both of P.O. Box 353, Ville Platte, La. 70586
Filed Dec. 15, 1969, Ser. No. 20,510
Term of patent 14 years
Int. Cl. D22—*07*
U.S. Cl. D22—27



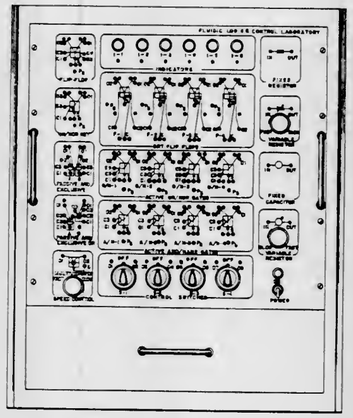
220,624
BATH FAUCET
Claude Urban, Buvingen 27, Pepingen, Belgium
Filed July 16, 1969, Ser. No. 18,217
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—23





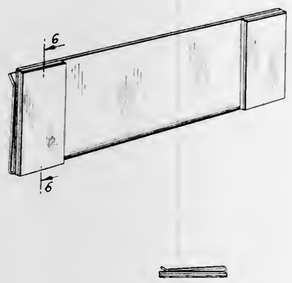
220,625
MAGNETIC TOY
Leonard Macpherson, Los Altos, Calif., assignor to Rathcon, Inc., Dallas, Tex.
Filed Dec. 11, 1969, Ser. No. 20,463
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D25—1

220,626
FLUIDIC LOGIC TRAINER COMPUTER
Vincent Randazzo, Brooklyn, N.Y. (680A Front St., Hempstead, N.Y. 11550)
Filed Aug. 22, 1969, Ser. No. 18,808
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

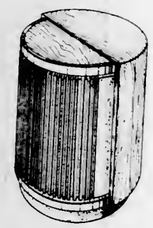


220,627
DATA TERMINAL CONSOLE
Elmer J. Stoltz, Castro Valley, and William J. Wohltmann, Jr., Mountain View, Calif., assignors to The Singer Company, New York, N.Y.
Filed Dec. 1, 1969, Ser. No. 20,318
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

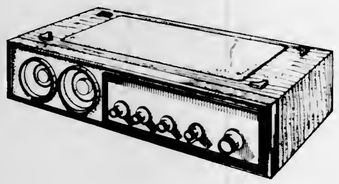
220,628
HOLDER FOR ATTACHMENT TO A TELEPHONE OR THE LIKE
Robert T. Crew, 3871 Gadsden Road, Jacksonville, Fla. 32207
Filed Sept. 2, 1969, Ser. No. 18,945
Term of patent 14 years
Int. Cl. D14—*99;* D20—*02*
U.S. Cl. D26—14



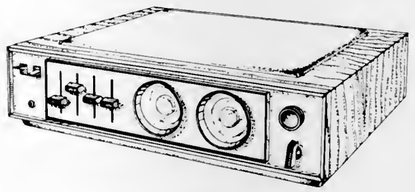
220,629
SPEAKER ENCLOSURE
Yuji Shimizu, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 9, 1970, Ser. No. 20,857
Claims priority, application Japan July 11, 1969
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—14



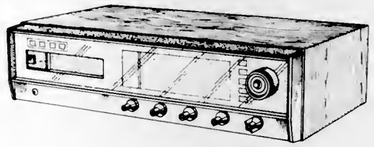
220,630
COMBINED AMPLIFIER HOUSING AND BASE FOR A RECORD PLAYER OR SIMILAR ARTICLE
Yuji Shimizu, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 9, 1970, Ser. No. 20,858
Claims priority, application Japan July 11, 1969
Term of patent 14 years
Int. Cl. D14—*04*
U.S. Cl. D26—14



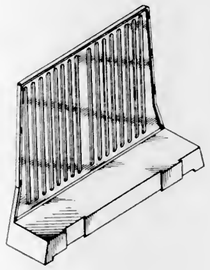
220,631
COMBINED AMPLIFIER HOUSING AND BASE FOR A RECORD PLAYER OR SIMILAR ARTICLE
Yoshiaki Iida, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Feb. 12, 1970, Ser. No. 21,422
Claims priority, application Japan Oct. 20, 1969
Term of patent 14 years
Int. Cl. D14—*04*
U.S. Cl. D26—14



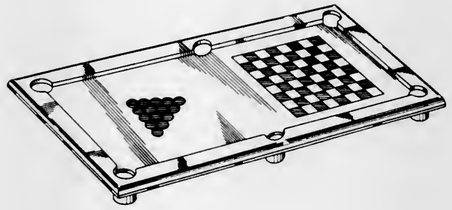
220,632
COMBINED AMPLIFIER AND TAPE RECORDER
Ippei Kurihara, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed June 4, 1970, Ser. No. 23,310
Claims priority, application Japan Dec. 10, 1969
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



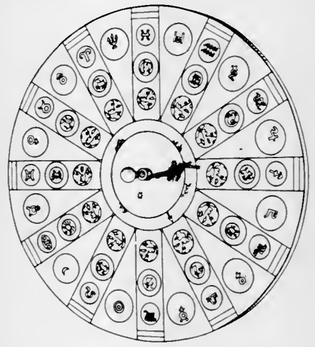
220,633
INTERLOCKABLE FILE RACK UNIT
Herbert Rome, Los Angeles, and Erland G. Paulson, Huntington Beach, Calif., assignors to Eldon Industries, Inc., Hawthorne, Calif.
Filed Dec. 12, 1969, Ser. No. 20,480
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—3



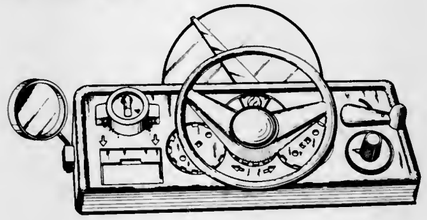
220,634
GAME BOARD OR THE LIKE
Basilio Fontana, 3339 E. 112th St., Cleveland, Ohio 44104
Filed Sept. 24, 1969, Ser. No. 19,291
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



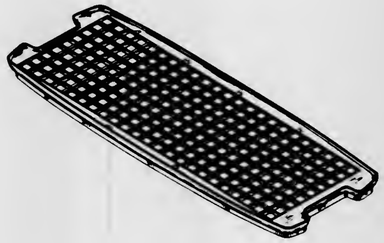
220,635
ASTROLOGY GAME BOARD
Richard G. Boyer and Lola Elizabeth Boyer, both of 7045 Hawthorn Ave., Hollywood, Calif. 90028
Filed Oct. 24, 1969, Ser. No. 19,698
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



220,636
COMBINED AUTOMOBILE DASHBOARD AND STEERING WHEEL TOY
Albert Stubbmann, Franklin Lakes, N.J., assignor to Kohner Bros., Inc., East Paterson, N.J.
Filed Feb. 12, 1970, Ser. No. 21,407
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15



220,637
DRAINER TRAY OR THE LIKE
James B. Swett, Barrington, R.I., and Sidney Z. Smith, Worcester, Mass., assignors to Dart Industries, Inc., Los Angeles, Calif.
Filed Jan. 28, 1970, Ser. No. 21,116
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—1



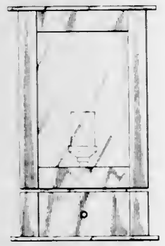
220,638
PLATE OR THE LIKE
Ottorino N. Mercadante, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed May 1, 1970, Ser. No. 22,756
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15

220,639
LADLE OR SIMILAR ARTICLE
Burt K. Todd, Ligonier, Pa., assignor to Kerr-Hays Co., Pittsburgh, Pa.
Filed Feb. 18, 1970, Ser. No. 21,481
Term of patent 7 years
Int. Cl. D7—*03*
U.S. Cl. D44—29

220,640
FINDING FOR COSTUME JEWELRY OR THE LIKE
Rolf E. Darbo, P.O. Box 2158,
Madison, Wis. 53701
Filed Dec. 19, 1969, Ser. No. 19,783
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—1

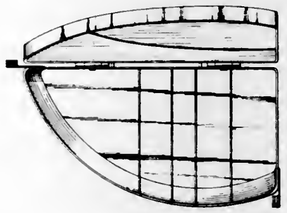
220,641
LIGHTING FIXTURE
Marilyn Lewis, Beverly Hills, Calif., assignor to
Hamburger Hamlets, Inc.
Filed Dec. 15, 1969, Ser. No. 20,496
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—4

220,642
COMBINED LAMP AND PICTURE HOLDER
Kenneth Roger Morehead, 205 Adams Ave.,
Cuyahoga Falls, Ohio 43221
Filed Jan. 3, 1969, Ser. No. 15,205
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—20

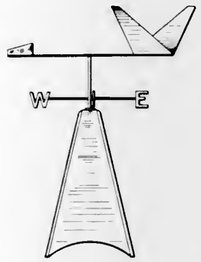


220,643
VEHICLE SIGNAL LIGHT
Joseph Nagy, 1513 Sherwood Court,
Dearborn, Mich. 48124
Filed Mar. 2, 1970, Ser. No. 21,701
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D48—32

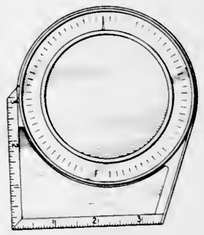
220,644
MONEY BOX
Leva Delores Robinson, 2320 E. Harvard Ave.,
Fresno, Calif. 93705
Filed Nov. 19, 1969, Ser. No. 20,171
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D52—4



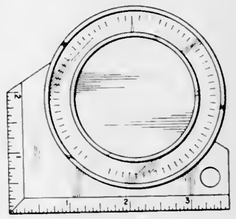
220,645
WEATHER VANE
Stephen Kwolek, 8385 Woodcrest Drive,
Westland, Mich. 48185
Filed June 18, 1970, Ser. No. 23,561
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D52—6



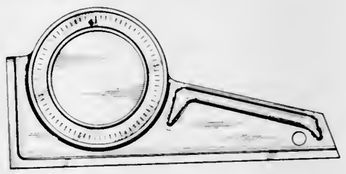
220,646
INCLINOMETER
Richard M. Provi, 1907 Brownfield Road 61107, and
Donald L. Payne, 4849 Danforth Drive 61111, both
of Rockford, Ill.
Filed June 22, 1970, Ser. No. 23,582
Term of patent 14 years
Int. Cl. D10—*08*
U.S. Cl. D52—6



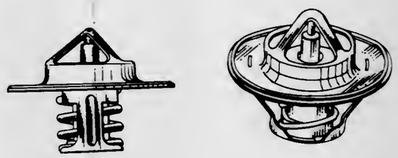
220,647
INCLINOMETER
Richard M. Provi, 1907 Brownfield Road 61107, and
Donald L. Payne, 4849 Danforth Drive 61111, both
of Rockford, Ill.
Filed June 22, 1970, Ser. No. 23,583
Term of patent 14 years
Int. Cl. D10—*08*
U.S. Cl. D52—6



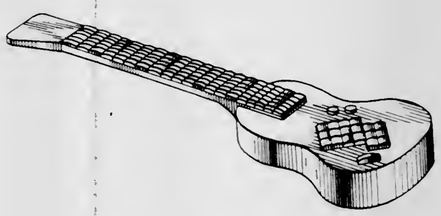
220,648
INCLINOMETER
Richard M. Provi, 1907 Brownfield Road 61107, and
Donald L. Payne, 4849 Danforth Drive 61111, both
of Rockford, Ill.
Filed June 22, 1970, Ser. No. 23,584
Term of patent 14 years
Int. Cl. D10—*08*
U.S. Cl. D52—6



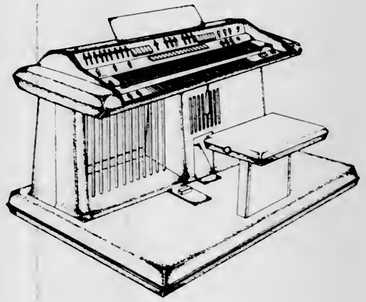
220,649
THERMOSTAT
Yoshikazu Kuze, 31-3, 1-chome, Magome Higashi,
Ota-ku, Tokyo, Japan
Filed Dec. 2, 1969, Ser. No. 20,333
Claims priority, application Japan June 5, 1969
Term of patent 14 years
Int. Cl. D10—*99*; D15—*01*
U.S. Cl. D52—7



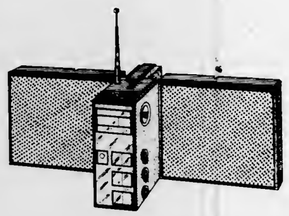
220,650
KEYBOARD-OPERATED ELECTRONIC MUSICAL INSTRUMENT
Robert N. Poznanovich, 9526 S. Manistee,
Chicago, Ill. 60617
Filed Aug. 4, 1969, Ser. No. 18,536
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D56—1



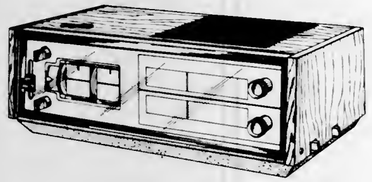
220,651
ELECTRONIC ORGAN CABINET OR SIMILAR ARTICLE
Hiroshi Saito, Osaka, and Masakazu Tatsumi, Hirakata,
and Yoshiji Kon'i, Nara, Japan, assignors to Matsushita
Electric Industrial Co., Ltd., Osaka, Japan
Filed May 6, 1970, Ser. No. 22,862
Claims priority, application Japan Nov. 20, 1969
Term of patent 14 years
Int. Cl. D17—*01*
U.S. Cl. D56—2



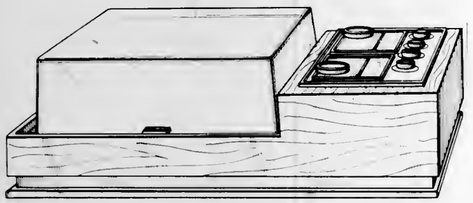
220,652
PORTABLE RADIO CABINET
Kazuhiro Hirayama and Hikaru Nakada, Tokyo, Japan, assignors to Hitachi, Ltd., Manufacturers, Tokyo, Japan
Filed Nov. 13, 1969, Ser. No. 20,071
Claims priority, application Japan May 23, 1969
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4



220,653
COMBINED RADIO RECEIVER AND CLOCK
Setsuo Miyanaga, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed June 22, 1970, Ser. No. 23,611
Claims priority, application Japan Jan. 23, 1970
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4

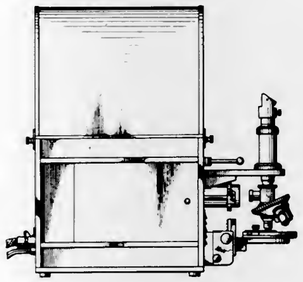


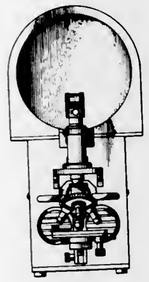
220,654
COMBINED RADIO AND RECORD CHANGER
Melvin H. Boldt, Glenview, and Kendrick T. Parsell, Chicago, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.
Filed Apr. 1, 1970, Ser. No. 22,187
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4



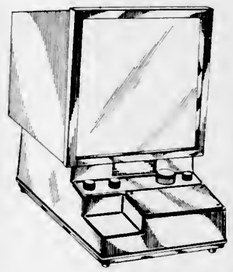
220,655
BRIDGE EXTENSION FOR EYEGLASSES
Toni Holloway, 73—465 Feather Trail, Palm Desert, Calif. 92260
Filed Oct. 2, 1969, Ser. No. 19,384
Term of patent 7 years
Int. Cl. D16—*08*
U.S. Cl. D57—1

220,656
METALLURGICAL OPAQUE PROJECTOR
Paul Rosenthal, 83–09 Talbot St., Kew Gardens, N.Y. 11415
Filed Oct. 13, 1969, Ser. No. 19,530
Term of patent 14 years
Int. Cl. D16—*03, 04*
U.S. Cl. D61—1

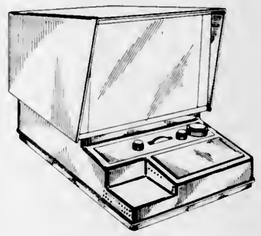




220,657
REAR PROJECTION VIEWER
William K. Christoffersen, North Minneapolis, James L. Keely, Wayzata, and William T. Owens, Jr., Long Lake, Minn., assignors to Washington Scientific Industries, Inc., Long Lake, Minn.
Filed May 21, 1970, Ser. No. 23,075
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1

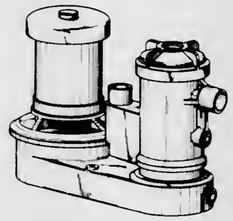


220,658
REAR PROJECTION VIEWER
William K. Christoffersen, North Minneapolis, James L. Keely, Wayzata, William T. Owens, Jr., Long Lake, and Larry D. Quanrud, North Minneapolis, Minn., assignors to Washington Scientific Industries, Inc., Long Lake, Minn.
Filed May 21, 1970, Ser. No. 23,091
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1

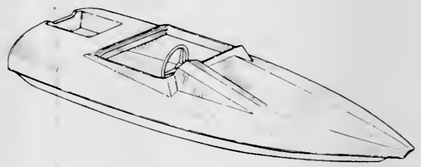


220,659
CALCULATING MACHINE
Mititaka Yamamoto, Kyoto-fu, Japan, assignor to Omron Tateisi Electronics Co., Kyoto-fu, Japan
Filed Mar. 27, 1969, Ser. No. 16,478
Claims priority, application Japan Sept. 29, 1968
Term of patent 7 years
Int. Cl. D18—*02*
U.S. Cl. D64—11

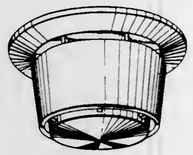
220,660
PUMP AND FILTER UNIT
Wilbur C. Smith, Plainfield, and Philip J. Nagengast, North Caldwell, N.J., assignors to Worthington Corporation, Harrison, N.J.
Filed Jan. 21, 1970, Ser. No. 21,018
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D65—1



220,661
BOAT
Ronald Howard Line, 15 Altamont Road, Willowdale, Ontario, Canada
Filed Dec. 29, 1969, Ser. No. 20,663
Claims priority, application Canada Dec. 1, 1969
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D71—1

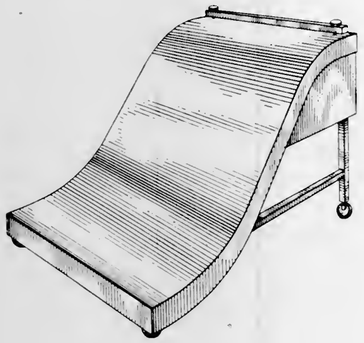


220,662
AUTOMATIC FIRE ALARM OR SIMILAR ARTICLE
Werner Buhrer, Uetikon am See, Switzerland, assignor to Cerberus AG, Mannedorf, Switzerland
Filed Nov. 12, 1969, Ser. No. 20,045
Claims priortly, application Switzerland May 12, 1969
Term of patent 14 years
Int. Cl. D29—*01*
U.S. Cl. D72—1

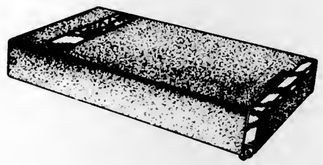


220,663
FOUNTAIN PEN NIB
Homer T. Green, Milton, Wis., assignor to The Parker Pen Company, Janesville, Wis.
Filed Apr. 22, 1970, Ser. No. 22,559
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D74—17

220,664
CARPET DISPLAY STAND
Ralph W. Wagoner, Naperville, Ill., assignor to Sears, Roebuck and Co., Chicago, Ill.
Filed Feb. 2, 1970, Ser. No. 21,191
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D80—9

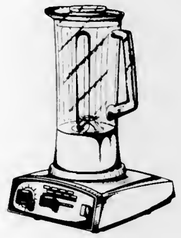


220,665
HEATER HOUSING FOR HAIR CURLERS
John L. Benty, Scotch Plains, N.J., and Svend Fischlein, Albertslund, Denmark, assignors to Bristol-Myers Company, New York, N.Y.
Filed Mar. 9, 1970, Ser. No. 21,794
Claims priority, application Denmark Oct. 7, 1969
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10



220,666
THERAPEUTIC CREEPING DEVICE
Reba M. Lillibridge, 9319 Canton Center Road, Plymouth, Mich. 48170
Filed Dec. 24, 1969, Ser. No. 20,632
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D88—5

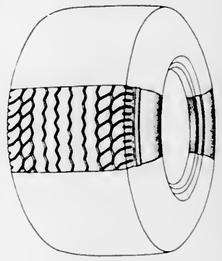
220,667
BLENDER OR SIMILAR ARTICLE
Yasuhiro Koshido and Hideo Kondou, Tokyo, and Koichiro Ninomiya and Itusei Sato, Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed June 5, 1970, Ser. No. 23,330
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D89—1



220,668
SIDEWALK BICYCLE
Frederick E. Purdy, Olney, Ill., assignor to AMF Incorporated
Filed May 1, 1970, Ser. No. 22,750
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D90—8

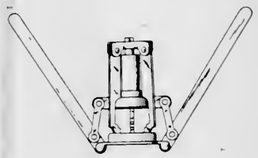
220,669
BICYCLE SEAT, OR SIMILAR ARTICLE
Charles V. Wrobel, Lake Forest, Walter Dian, Downers Grove, and Gerald Golden, Highland Park, Ill., assignors to Excel Incorporated, Franklin Park, Ill.
Filed Sept. 18, 1969, Ser. No. 19,199
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D90—16

220,670
TIRE
Iain C. Mills, Sutton Coldfield, England, assignor to The Dunlop Company Limited, Birmingham, England
Filed Feb. 20, 1970, Ser. No. 21,543
Claims priority, application Great Britain Aug. 28, 1969
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D90—20

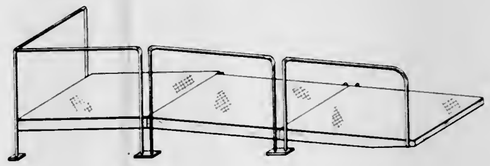


220,671
TOWEL OR SIMILAR ARTICLE
Edward C. Taiman, Tarrytown, N.Y., assignor to Cannon Mills Company, Kannapolis, N.C.
Filed June 9, 1970, Ser. No. 23,394
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D92—26

220,672
BOTTLE CAPPER
Iganzio Ronchetti, Via Fratelli Calvi 67, Calolziocorte, Italy
Filed Mar. 18, 1970, Ser. No. 21,951
Term of patent 3½ years
Int. Cl. D15—*05*
U.S. Cl. D94—3



220,673
COMBINED PLATFORM AND RAMP
Harry W. Holbrook, 9 Donegal Way, Pinole, Calif. 94564
Filed Dec. 22, 1969, Ser. No. 20,592
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—7



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 4TH DAY OF MAY, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aasnaes, Hans Bent, to International Business Machines Corporation. Triple integrating ramp analog to digital converter. 3,577,140, Cl. 340-347.
AB Electrolux: *See—*
Klug, Oluf Walter Henry, 3,577,363.
Abbott Laboratories: *See—*
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Achenbach Sohne G.m.b.H.: *See—*
Barten, Ernst H., 3,577,757.
Ackermann, Horst: *See—*
Bippus, Walter; and Ackermann, Horst,3,577,700.
Adair, James Richard, to United Engineering and Foundry Company. Apparatus for extracting chocks, guides and couplings from roll assemblies. 3,577,758, Cl. 72-239.
Adamaszek, Kazimerz. Sensing device for automatic braking of the spindle in ring spinning and ring twisting machines. 3,577,722, Cl. 57-80.
Adams, Charles R.; Arpe, Hans J.; Schulze-Steinen, Hans J.; Falbe, Jurgen F.; Edwards, Alan C.; and Tetteroo, Hans, to Shell Oil Company. Process of preparing tritylamines. 3,577,413, Cl. 260-247.
Adams, James S., to Magnavox Company, The. Modified latch circuit specifically for search tuning arrangement. 3,577,083, Cl. 325-471.
Adams, Thomas: *See—*
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Adelaar, Hans Helmut: *See—*
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Aga Aktiebolag: *See—*
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Agfa-Gevaert Aktiengesellschaft: *See—*
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Erby, William A.; and Walde, Robert A., 3,577,546.
Air Reduction Company, Incorporated: *See—*
Sullivan, Cornelius J., 3,576,966.
Aitken, John, to Schlumberger Technology Corporation. Well logging tool for making multiple pressure tests and for bottom hole sampling. 3,577,782, Cl. 73-155.
Akashi, Goro: *See—*
Sato, Masamichi; Tamai, Yasuo; Matsumoto, Seiji; and Akashi, Goro,3,577,259.
Akew, Robert E.; and Johnson, Henry C., to United States of America, Army, mesne. Meterorological device employing a temperature compensated transmitter. 3,577,100, Cl. 331-117.
Aktiebolaget Nordstroms Linbanor: *See—*
Kohler, Karl Gustav, 3,577,703.
A&L Battery & Electric Service, Inc.: *See—*
Aprill, Theophil, Jr.; and Leerkamp, John R., 3,577,768.
Al-Roy, John D., to Monsanto Company. Apparatus for forming hollow articles. 3,577,594, Cl. 18-19.
Albsmeier, Hans; and Traub, Karl, to Siemens Aktiengesellschaft. Electromechanical filter. 3,577,180, Cl. 333-72.
Alburn, Harvey E.; Dvonch, William; and Sallay, Stephan, to American Home Products Corporation. Tetrahydro-2-oxofuran penicillins. 3,577,408, Cl. 260-239.1
Alden, Milton, to Alden Research Foundation. Recording helix. 3,577,150, Cl. 346-139.
Alden Research Foundation: *See—*
Alden, Milton, 3,577,150.
Aldrich, Ralph E.; and Caruso, Paul J., to Itek Corporation. Real-time solid state camera system. 3,577,200, Cl. 178-7.1
Alexander, Arthur P.; Aronson, Steven R.; and Langenhagen, Charles F., Jr., to Packaged Resins Company, Inc. Shoe last remodeling jig. 3,577,578, Cl. 12-146.
Alexander, Jerry; and Stevens, Irving J. Ratchet wrench. 3,577,816, Cl. 81-63.1
Alexander, Robert H.; Falter, Ronald C.; Ringer, Cecil D.; and Linsker, Eugene, to Rockwell Manufacturing Company. Portable power tool. 3,577,807, Cl. 77-13.
Allen & Hamburys Limited: *See—*
Jack, David; and Rhodes, Deryck, 3,577,549.
Allen, Frank L., Jr.: *See—*
Bliven, Roger; Allen, Frank L., Jr.; and Davis, John R.,3,577,271.
Allen-Bradley Company: *See—*
Dummermuth, Ernst H., 3,577,012.
McCall, Amiel J.; Elms, Ronald D.; and Rice, Larry D., 3,576,979.
Weidmann, Hans E., 3,577,016.
Allied Chemical Corporation: *See—*
Anello, Louis Gene; Sweeney, Richard Francis; and Litt, Morton Herbert, 3,577,465.
Brownstein, Arthur M.; and Sibilla, John P., 3,577,458.
Le Noir, Fred W., 3,577,615.
Sweeney, Richard F.; and Price, Alson K., 3,577,447.
Allinquant, Fernand Stanislas. Meat tenderizing machine. 3,577,585, Cl. 17-25.
Allis-Chalmers Manufacturing Company: *See—*
Foster, Samuel L.; and Johnston, Reed M., 3,577,109.
Ringland, William L.; Neumann, Manfred E.; Kaeser, Ernst K.; Gilmore, Thomas P.; and Geiersbach, Allois F., 3,577,050.
Allmann Svenska Elektriska Aktiebolaget: *See—*
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Allmanna Svenska Elektriska Aktiebolaget: *See—*
Bengtson, Waldemar; and Dahle, Orvar, 3,577,108.
Bergman, Carl; and Claesson, Harry, 3,577,635.
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Kring, Arne; and Johansson, Arne, 3,577,041.
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Alm, Christian A.: *See—*
Stone, John G.; Buettner, George S.; and Alm, Christian A.,3,576,940.
Alpha Metals, Inc.: *See—*
Schneider, Alvin; and Tarnowsky, Joseph, 3,577,284.
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Speichinger, Ferdinand, 3,577,602.
Aluminum Company of America: *See—*
Zelley, Walter G.; and Walton, Charles J., 3,577,288.
Amann, Willard R., to Eastman Kodak Company. Magnetic clamp. 3,577,583, Cl. 16-87.2
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American Cyanamid Company: *See—*
Bott, George Spencer; and Marlow, William Henry, 3,577,701.
Cantrall, Margot Louise; Sassiver, Martin Leon; and Shepherd, Robert Gordon, 3,577,417.
Dorbransky, Robert Alan, 3,577,402.
Fidell, Louis Isadore, 3,577,342.
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Megna, Ignazio Salvatore; and Koroscil, Anthony, 3,577,388.
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Nielsen, Peter Adams; Cooper, Murray Sam; and Doyno, Ernest Robert, 3,577,319.
Pensack, Joseph Michael, 3,577,529.
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American Enka Corporation: *See—*
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American Hoechst Corporation: *See—*
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American Home Products Corporation: *See—*
Alburn, Harvey E.; Dvonch, William; and Sallay, Stephan, 3,577,408.
Archibald, John L.; and Freed, Meier E., 3,577,423.
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Ruggles, Kay L.; Gunnerson, Dale B.; and Clark, Howard S., 3,577,572.
American Telephone and Telegraph Company: *See—*
Swierczewski, Witold E.; and Swierczewski, Witold E., 3,577,155.
Ametek, Inc.: *See—*
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Amicon Corporation: *See—*
Bolger, Justin C.; Mc Collum, Hugh Evan; and Hausslein, Robert William, 3,577,313.
AMP Incorporated: *See—*
Bruetsch, Harold Louis, 3,577,117.
Delyon, Armand Rene; and Kensinger, Lex Donald, 3,577,119.
Hammond, James Woodrow, 3,577,814.
Hoffman, Norman Edwin, 3,577,496.
Pountney, Clifford Harold; and Miller, Edward Francis, 3,577,281.

Reider, George Sylvester, 3,577,118.
Amsted Industries Incorporated: *See—*
Ratcliffe, Edward; and Crawford, William N., 3,577,644.
Amster, Robert L., to General Telephone & Electronics Laboratories, Incorporated. Europium and manganese sodium aluminate phosphors. 3,577,350, Cl. 252-301.4
Anaconda Wire and Cable Company: *See—*
Bernhard, George D.; and Schwarz, Olek, 3,577,034.
Pendleton, Wesley W.; and Ostrander, George W., 3,577,309.
Anderson Bros. Mfg. Co.: *See—*
Jacobson, William P., 3,577,484.
Anderson, Donald E.: *See—*
Anderson, Donald E.; Koch, Lawrence M.; Lloyd, Robert E.; Sordello, Frank J.; Anderson, Donald E.; Koch, Lawrence M.; Lloyd, Robert E.; and Sordello, Frank J.,3,577,132.
Anderson, Donald E.; Koch, Lawrence M.; Lloyd, Robert E.; Sordello, Frank J.; Anderson, Donald E.; Koch, Lawrence M.; Lloyd, Robert E.; and Sordello, Frank J., to International Business Machines Corporation. Phase locked oscillator for storage apparatus. 3,577,132, Cl. 340-174.1
Anello, Louis Gene; Sweeney, Richard Francis; and Litt, Morton Herbert, to Allied Chemical Corporation. Terminally unsaturated fluoroolefins. 3,577,465, Cl. 260-614.
Anhorn, Victor J.: *See—*
Pace, Henry A.; and Anhorn, Victor J.,3,577,398.
Aoki, Ichiro; Iwasaki, Kenji; Yoshihashi, Tamaji; Koinuma, Tokuju; Kato, Masao; and Fukatu, Akihiro, to Tokyo Shibaura Electric Co., Ltd. Magnetron device with cooling fluid flow in longitudinal direction of magnetron tube. 3,577,033, Cl. 315-39.71
Apikos, Dominic: *See—*
Kremer, Charles J.; Brown, Donald S.; Apikos, Dominic; and Thean, John T.,3,577,373.
Appleton, Bernard S. Method of attaching transmission belt and pin. 3,577,630, Cl. 29-517.
Applied Synthetics Corporation: *See—*
Silverstein, Paul, 3,577,820.
Aprill, Theophil, Jr.; and Leerkamp, John R., to A&L Battery & Electric Service, Inc. Hydrostatic testing apparatus. 3,577,768, Cl. 73-40.5
Arant, Gene W.,: *See—*
Lee, Robert L., 3,577,639.
Arant, Juanita F.,: *See—*
Lee, Robert L., 3,577,639.
Archibald, John L.; and Freed, Meier E., to American Home Products Corporation. 1,4-Bis-(3-indoleglyoxyloyl) piperazines and derivatives thereof. 3,577,423, Cl. 260-268.
Ardary, Zane L.; Maxey, Andrew W.; and Reynolds, Carl D., to United States of America, Atomic Energy Commission. Fibrous thermal insulation and method of making same. 3,577,344, Cl. 252-62.
Argabright, Perry A.; Phillips, Brian L.; and Sinkey, Vernon J., to Marathon Oil Company. Alchol-blocked isocyanate compositions and derivatives. 3,577,391, Cl. 260-77.5
Arima, Hideki: *See—*
Murakami, Masuo; Kuriaki, Kaname; Iwanami, Masaru; Arima, Hideki; Sano, Kenji; Suzuki, Hiroshi; and Kagami, Soichi,3,577,551.
Arimura, Katsuo: *See—*
Nakanishi, Michio; Arimura, Katsuo; Imamura, Hiroshi; and Kobayakawa, Toshihiro,3,577,425.
Arizona Chemical Company: *See—*
Sheers, Edward Helmut, 3,577,230.
Armour and Company: *See—*
Phillips, Duane; Schultz, Roger C.; and Beck, Herbert H., 3,577,296.
Armour Industrial Chemical Company: *See—*
Castro, Anthony J.; Marsh, Frederick S.; Kinney, Layton E.; and Fischl, Frank J., 3,577,370.
Dybalski, Jack N., 3,577,249.
Armour Pharmaceutical Company: *See—*
Reynolds, Harold C.; and Olsen, Donald B., 3,577,535.
Armstrong Cork Company: *See—*
Ward, John M., 3,577,222.
Armstrong, William J.; Healy, Albert M.; and Duffy, Michael C., to International Business Machines Corporation. Integrated semiconductor devices and fabrication methods therefor. 3,577,044, Cl. 317-235.
Arnold, Nancy Hazlett: *See—*
McCormick, Jerry Robert Daniel; and Arnold, Nancy Hazlett,3,577,439.
Arntz, Robert L.; and Marker, John R., Jr., to Dominion Electric Corporation. Transformer having a wound core around linear conductors. 3,577,110, Cl. 336-175.
Aronson, Steven R.: *See—*
Alexander, Arthur P.; Aronson, Steven R.; and Langenhagen, Charles F., Jr.,3,577,578.
Arpe, Hans J.: *See—*
Adams, Charles R.; Arpe, Hans J.; Schulze-Steinen, Hans J.; Falbe, Jurgen F.; Edwards, Alan C.; and Tetteroo, Hans,3,577,413.
Asano, Kuniji: *See—*
Kubo, Moritada; and Asano, Kuniji,3,577,773.
Ashland Oil, Inc.: *See—*
Forrester, Robert A.; and Mc Nay, Ralph E., 3,577,555.
Sedgwick, Grant O., 3,577,383.
Ashley, Eugene; and Tassie, Douglas Pray, to General Electric Company. Bellows sealed firing pin. 3,577,826, Cl. 89-26.
Ashmore, Carles I., to Thiokol Chemical Corporation. Process for the preparation of a combustion additive. 3,577,449, Cl. 260-439.
Asp, Ivar Alvar. Opening device for cans and similar containers provided with twist lids. 3,577,812, Cl. 81-3.36
Asquith, Claire F.: *See—*
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LIST OF DESIGN PATENTEES

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Rathcon, Inc.: *See*—
Macpherson, Leonard. 220,625.

Reichert, Leonard K. Cutting block. 220,614, 5-4-71, Cl. D11—1.

Robinson, Leva D. Money box. 220,644, 5-4-71, Cl. D52—4.

Rome, Herbert, and E. G. Paulson, to Elden Industries, Inc. Interlockable file rack unit. 220,633, 5-4-71, Cl. D33—3.

Ronchetti, Ignazio. A bottle capper. 220,672, 5-4-71, Cl. D94—3.

Rosenthal, Paul. Metallurgical opaque projector. 220,656, 5-4-71, Cl. D61—1.

Rowley, Ernest W. Snowmobile trailer. 220,619, 5-4-71, Cl. D14—24.

Saito, Hiroshi, M. Tatsumi, and Y. Kon'i, to Matsushita Electric Industrial Co., Ltd. Electronic organ cabinet or similar article. 220,651, 5-4-71, Cl. D56—2.

Sears, Roebuck and Co.: *See*—
Wagoner, Ralph W. 220,664.

Schwartz, Gerald D., to United Bus Sales, Inc. Motor home. 220,616, 5-4-71, Cl. D14—3.

Schultze, Louis, J. Necktie or the like. 220,608, 5-4-71, Cl. D2—351.

Scovill Manufacturing Co.: *See*—
Beck, Theodore A. 220,613.

Shimizu, Yuji, to Matsushita Electric Industrial Co., Ltd. Speaker enclosure. 220,629, 5-4-71, Cl. D26—14.

Shimizu, Yuji, to Matsushita Electric Industrial Co., Ltd. Combined amplifier housing and base for a record player or similar article. 220,630, 5-4-71, Cl. D26—14.

Siegler, Kenneth E. Beer can. 220,612, 5-4-71, Cl. D9—216.

Singer Co., The: *See*—
Stoltz, Elmer J., and Wohltmann. 220,627.

Smith, Sidney Z.: *See*—
Swett, James B., and Smith. 220,637.

Smith, Wilbur C., and P. J. Nagengast, to Worthington Corp. Pump and filter unit. 220,660, 5-4-71, Cl. D65—1.

Stoltz, Elmer J., and W. J. Wohltmann, Jr., to The Singer Co. Data terminal console. 220,627, 5-4-71, Cl. D26—5.

Stubbmann, Albert, to Kohner Bros., Inc. Combined automobile dashboard and steering wheel toy. 220,636, 5-4-71, Cl. D34—15.

Swett, James B., and S. Z. Smith, to Dart Industries, Inc. Drainer tray or the like. 220,637, 5-4-71, Cl. D44—1.

Taiman, Edward C., to Cannon Mills Co. Towel or similar article. 220,671, 5-4-71, Cl. D92—26.

Tatsumi, Masakazu: *See*—
Saito, Hiroshi, Tatsumi, and Kon'i. 220,651.

Thompson, William L. Portable outhouse. 220,615, 5-4-71, Cl. D13—1.

Todd, Burt K., to Kerr-Hays Co. Ladle or similar article. 220,639, 5-4-71, Cl. D44—29.

United Bus Sales, Inc.: *See*—
Schwartz, Gerald D. 220,616.

Urban, Claude. Bath faucet. 220,624, 5-4-71, Cl. D23—23.

Wagoner, Ralph W., to Sears, Roebuck and Co. Carpet display stand. 220,664, 5-4-71, Cl. D80—9.

Washington Scientific Industries, Inc.: *See*—
Christoffersen, William K., Keely, and Owens. 220,757.

Wohltmann, William J., Jr.: *See*—
Stoltz, Elmer J., and Wohltmann. 220,627.

Worthington Corp.: *See*—
Smith, Wilbur C., and Nagengast. 220,660.

Wrobel, Charles V., W. D. Dian, and G. Golden, to Excel Inc. Bicycle seat or similar article. 220,669, 5-4-71, Cl. D90—16.

Yamamoto, Mititaka, to Omron Tateisi Electronics Co. Calculating machine. 220,659, 5-4-71, Cl. D64—11.

Zenith Radio Corp.: *See*—
Boldt, Melvin B., and Parsell. 220,654.

CLASSIFICATION OF PATENTS

ISSUED MAY 4, 1971

NOTE.—First number, class; second number, subclass; third number, patent number

2– 3	3,577,561
	3,577,562
8	3,577,563
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85– 76	3,577,825
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96– 1.6	3,577,235
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84	3,576,959
144	3,576,960
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167	3,576,962
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241	3,577,321
203– 11	3,577,322
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183	3,577,157
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219	3,577,163
230	3,577,000
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62	3,577,344
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78	3,577,392

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.2	3,577,400	545	3,577,458	307– 66	3,577,003	237	3,577,175	17	3,577,103	770	3,577,196
92.8	3,577,401	551	3,577,459	141	3,577,004	318– 52	3,577,048	72	3,577,180	771	3,577,197
97	3,577,402	566	3,577,460	205	3,577,005	138	3,577,049	73	3,577,104	778	3,577,147
160	3,577,403	570.5	3,577,461	218	3,577,006	146	3,577,050	84	3,577,181	821	3,577,148
162	3,577,404	.6	3,577,462	228	3,577,007	212	3,577,051	95	3,577,105	346– 46	3,577,149
193	3,577,405	586	3,577,463		3,577,165	230	3,577,052	98	3,577,106	75	3,577,198
211	3,577,406	601	3,577,464	233	3,577,008	254	3,577,053	335–185	3,577,182	139	3,577,150
233.3	3,577,407	614	3,577,465		3,577,009	257	3,577,054	248	3,577,107	408– 17	3,577,807
239.1	3,577,408		3,577,466	240	3,577,206	302	3,577,055	336– 20	3,577,108	61	3,577,808
.3	3,577,557	618	3,577,366	252	3,577,010	314	3,577,056	84	3,577,109	162	3,577,810
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.6	3,577,409	648	3,577,468	271	3,577,012	432	3,577,176	337– 89	3,577,111	424– 9	3,577,511
240	3,577,411		3,577,469	273	3,577,013	691	3,577,058	338– 4	3,577,112	21	3,577,512
243	3,577,412	650	3,577,470		3,577,014	321– 10	3,577,059	26	3,577,183	22	3,577,513
247	3,577,413	656	3,577,471		3,577,015	11	3,577,060	339– 17	3,577,113		3,577,514
	3,577,414	660	3,577,472	279	3,577,166	322– 27	3,577,061	36	3,577,115	32	3,577,515
.2	3,577,415	666	3,577,473	284	3,577,017	323– 8	3,577,062	94	3,577,114	46	3,577,516
248	3,577,416	668	3,577,474	293	3,577,168	16	3,577,063	125	3,577,116	47	3,577,517
249.6	3,577,417		3,577,475	296	3,577,167	18	3,577,177	248	3,577,117		3,577,518
250	3,577,418		3,577,476	297	3,577,016	20	3,577,064	258	3,577,118	54	3,577,520
256.4	3,577,419	683.3	3,577,477	299	3,577,018	22	3,577,065	276	3,577,119	55	3,577,521
	3,577,420	.75	3,577,479	304	3,577,019	69	3,577,066	340– 17	3,577,184	70	3,577,528
268	3,577,421	862	3,577,478	310– 8.2	3,577,020	324– .5	3,577,067	27	3,577,120	78	3,577,522
	3,577,422	869	3,577,480	.7	3,577,021		3,577,068	59	3,577,121	88	3,577,523
	3,577,423	942	3,577,481	10	3,577,022		3,577,069	114	3,577,122	89	3,577,524
287	3,577,424	973	3,577,482	13	3,577,023	51	3,577,070	146.1	3,577,123		3,577,525
293.4	3,577,425	977	3,577,483	54	3,577,024	58.5	3,577,071		3,577,186		3,577,526
297	3,577,426	264– .5	3,577,485	239	3,577,025	60	3,577,072	153	3,577,124	92	3,577,527
304	3,577,427	8	3,577,560	313– 63	3,577,026	73	3,577,073	163	3,577,187	114	3,577,529
307	3,577,428	45	3,577,486	101	3,577,027	83	3,577,178	164	3,577,188	118	3,577,530
314.5	3,577,429	53	3,577,360	109	3,577,169	98	3,577,074	166	3,577,125	122	3,577,531
325	3,577,430	54	3,577,519	123	3,577,170	99	3,577,075	167	3,577,126	149	3,577,532
326.1	3,577,431	56	3,577,487	223	3,577,028	115	3,577,076	172.5	3,577,127	155	3,577,533
.11	3,577,435	92	3,577,484	229	3,577,029	140	3,577,077		3,577,128	183	3,577,534
.3	3,577,432	95	3,577,488	315– 9	3,577,171	154	3,577,078		3,577,129	198	3,577,535
	3,577,440	117	3,577,489	13	3,577,031	325– 53	3,577,079		3,577,130	200	3,577,536
.5	3,577,433	120	3,577,490	36	3,577,032	183	3,577,080		3,577,185	201	3,577,537
	3,577,434		3,577,491	39	3,577,207	329	3,577,081		3,577,189	214	3,577,538
328	3,577,558		3,577,492	.3	3,577,172	416	3,577,082		3,577,190	231	3,577,539
330.5	3,577,436	137	3,577,493	.71	3,577,033	471	3,577,083	174	3,577,131	244	3,577,540
333	3,577,438	143	3,577,494	88	3,577,173	328– 14	3,577,084		3,577,134	249	3,577,541
343.3	3,577,439	153	3,577,495	111	3,577,030	42	3,577,085	.1	3,577,132	251	3,577,542
346.2	3,577,441	156	3,577,496	170	3,577,174	62	3,577,086		3,577,133		3,577,543
.3	3,577,442	159	3,577,497	317– 2	3,577,208	110	3,577,087		3,577,191	269	3,577,553
348	3,577,443	168	3,577,498	22	3,577,034	134	3,577,088		3,577,192	272	3,577,544
378	3,577,444	182	3,577,499	31	3,577,035	165	3,577,089	228	3,577,193	273	3,577,545
397.5	3,577,445	210	3,577,500	98	3,577,209	330– 24	3,577,091	251	3,577,135	279	3,577,546
403	3,577,446	213	3,577,501	101	3,577,036	69	3,577,090	280	3,577,136	286	3,577,547
404.5	3,577,447	235	3,577,502		3,577,037	107	3,577,179	324	3,577,137	288	3,577,548
410.6	3,577,559	244	3,577,503		3,577,038	124	3,577,092	347	3,577,138	317	3,577,549
429	3,577,448	255	3,577,504	127	3,577,039	331– 94.5	3,577,093		3,577,139	324	3,577,550
439	3,577,449	256	3,577,505	148.5	3,577,040		3,577,094		3,577,140	325	3,577,551
448	3,577,450	272	3,577,506		3,577,041		3,577,095		3,577,141	326	3,577,552

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D 9– 43	220,609	24	220,619		220,630	D48– 4	220,641	4	220,652	D74– 17	220,663
48	220,610	D15– 11	220,620		220,631	20	220,642		220,653	D80– 9	220,664
117	220,611	D16–	220,621		220,632	32	220,643		220,654	D86– 10	220,665
216	220,612	D18– 2	220,622	D33– 3	220,633	D52– 4	220,644	D57– 1	220,655	D88– 5	220,666
258	220,613	D22– 27	220,623	D34– 5	220,634	6	220,645	D61– 1	220,656	D89– 1	220,667
D11– 1	220,614	D23– 23	220,624		220,635		220,646		220,657	D90– 8	220,668
D13– 1	220,615	D25– 1	220,625	15	220,636		220,647		220,658	16	220,669
7	220,673	D26– 5	220,626	D44– 1	220,637		220,648	D64– 11	220,659	20	220,670
D14– 3	220,616		220,627	15	220,638	7	220,649	D65– 1	220,660	D92– 26	220,671
	220,617	14	220,628	29	220,639	D56–	220,650	D71– 1	220,661	D94– 3	220,672

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Patents

1	3,577,017	6	3,577,193	6	3,577,793	12	3,577,748	18	3,577,287	25	3,577,143
	3,577,077		3,577,196		3,577,815	13	3,577,495		3,577,333		3,577,150
	3,577,331		3,577,210	8	3,576,948		3,577,540		3,577,385		3,577,157
	3,577,697		3,577,221		3,576,971		3,577,676		3,577,412		3,577,169
	3,577,737		3,577,223		3,577,071	15	3,577,647		3,577,467		3,577,172
4	3,576,986		3,577,233		3,577,391	17	3,576,946		3,577,490		3,577,187
	3,577,010		3,577,243		3,577,506		3,576,950		3,577,531		3,577,200
	3,577,160		3,577,246		3,577,669		3,576,961		3,577,680		3,577,204
	3,577,195		3,577,247		3,577,674		3,576,967		3,577,776		3,577,205
	3,577,306		3,577,250	9	3,576,940		3,576,970		3,577,806		3,577,237
	3,577,710		3,577,294		3,576,974		3,577,004	19	3,577,006		3,577,271
	3,577,744		3,577,297		3,576,985		3,577,020		3,577,142		3,577,313
	3,577,771		3,577,317		3,576,987		3,577,027		3,577,407		3,577,315
6	3,576,944		3,577,323		3,577,003		3,577,080		3,577,426		3,577,374
	3,576,947		3,577,324		3,577,094		3,577,103	20	3,577,375		3,577,437
	3,576,969		3,577,332		3,577,115		3,577,116		3,577,392		3,577,503
	3,576,973		3,577,338		3,577,267		3,577,136		3,577,431		3,577,508
	3,576,978		3,577,353		3,577,268		3,577,164	21	3,576,963		3,577,574
	3,576,980		3,577,356		3,577,269		3,577,249		3,577,163		3,577,578
	3,576,983		3,577,357		3,577,292		3,577,282		3,577,584		3,577,593
	3,576,984		3,577,413		3,577,327		3,577,283	22	3,577,414		3,577,596
	3,576,990		3,577,427		3,577,328		3,577,293		3,577,649		3,577,610
	3,576,991		3,577,442		3,577,402		3,577,364	23	3,577,828		3,577,613
	3,577,007		3,577,444		3,577,420		3,577,367	24	3,577,013		3,577,629
	3,577,011		3,577,466		3,577,507		3,577,370		3,577,028		3,577,651
	3,577,023		3,577,475		3,577,514		3,577,422		3,577,030		3,577,730
	3,577,031		3,577,533		3,577,519		3,577,452		3,577,062		3,577,769
	3,577,042		3,577,545		3,577,523		3,577,482		3,577,070		3,577,779
	3,577,052		3,577,563		3,577,589		3,577,484		3,577,084	26	3,576,959
	3,577,054		3,577,571		3,577,656		3,577,492		3,577,091		3,576,976
	3,577,057		3,577,582		3,577,668		3,577,527		3,577,135		3,576,999
	3,577,066		3,577,606		3,577,696		3,577,535		3,577,171		3,577,049
	3,577,067		3,577,622	10	3,577,266		3,577,552		3,577,218		3,577,068
	3,577,095		3,577,634		3,577,304		3,577,567		3,577,232		3,577,121
	3,577,096		3,577,639		3,577,443		3,577,579		3,577,289		3,577,134
	3,577,097		3,577,640		3,577,564		3,577,581		3,577,379		3,577,215
	3,577,098		3,577,643		3,577,565		3,577,612		3,577,487		3,577,262
	3,577,122		3,577,646		3,577,614		3,577,645		3,577,590		3,577,263
	3,577,130		3,577,670	11	3,577,014		3,577,665		3,577,605		3,577,264
	3,577,132		3,577,678		3,577,105		3,577,684		3,577,708		3,577,265
	3,577,133		3,577,679		3,577,322		3,577,687		3,577,775		3,577,309
	3,577,139		3,577,693	12	3,576,968		3,577,698	25	3,576,996		3,577,355
	3,577,146		3,577,705		3,577,009		3,577,704		3,576,997		3,577,380
	3,577,155		3,577,711		3,577,038		3,577,714		3,576,998		3,577,406
	3,577,165		3,577,728		3,577,298		3,577,726		3,577,000		3,577,455
	3,577,170		3,577,734		3,577,562		3,577,765		3,577,029		3,577,486
	3,577,178		3,577,763		3,577,638	18	3,577,001		3,577,072		3,577,494
	3,577,190		3,577,770		3,577,650		3,577,060		3,577,088		3,577,548
	3,577,191		3,577,777		3,577,690		3,577,083		3,577,102		3,577,550
	3,577,192		3,577,792		3,577,731		3,577,168		3,577,104		3,577,559

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PATENT OFFICE NOTICES

Dedication

3,480,617.—*Kelly Farhat*, Akron, Ohio. N-(p-SUBSTITUTED AMINOPHENYL) CYCLIC ALKYLENEIMINES AND THEIR PREPARATION. Patent dated Nov. 25, 1969. Dedication filed Dec. 21, 1970, by the assignee, *The Firestone Tire & Rubber Company*.

Hereby dedicates to the people of the United States the entire term of said patent.

Disclaimers

3,525,317.—*Earl B. Muir*, Rolling Hills Estates, Calif. VEHICLE ENGINE BRAKING SYSTEM. Patent dated Aug. 25, 1970. Disclaimer filed Jan. 27, 1971, by the assignee, *White Motor Corporation*.

Hereby enters this disclaimer to claims 1, 2, 6, 16 and 18 of said patent.

3,533,155.—*Alexander Coucoulas*, Bridgewater Township, Somerset County, N.J. BONDING WITH A COMPLIANT MEDIUM. Patent dated Oct. 13, 1970. Disclaimer filed Feb. 1, 1971, by the assignee, *Western Electric Company, Incorporated*.

Hereby enters this disclaimer to claims 9, 17 and 20 of said patent.

Disclaimer and Dedication

3,085,916.—*William E. Zimmie*, Bay Village, Ohio, and *Frederick W. Bloecher, Jr.*, Stamford, Conn. METHOD OF REMOVING AND PREVENTING ACCUMULATION IN COOLING SYSTEMS. Patent dated Apr. 16, 1963. Disclaimer and dedication filed Dec. 7, 1970, by the assignee, *W. E. Zimmie, Inc.*

Hereby disclaims and dedicates to the Public the terminal portion of the patent subsequent to Mar. 5, 1980.

Certificates of Correction for the Week of May 11, 1971

Re. 27,019	3,541,745	3,552,516	3,556,383
3,335,010	3,542,107	3,552,694	3,556,387
3,384,489	3,542,495	3,552,718	3,556,422
3,395,017	3,543,651	3,553,023	3,556,459
3,403,637	3,543,769	3,553,097	3,557,026
3,446,792	3,543,860	3,553,155	3,557,037
3,459,539	3,545,287	3,553,178	3,557,129
3,492,255	3,545,333	3,553,329	3,557,193
3,492,797	3,545,370	3,553,466	3,557,289
3,498,372	3,545,403	3,553,516	3,557,299
3,509,124	3,545,571	3,553,603	3,557,337
3,514,965	3,545,729	3,553,835	3,557,722
3,519,603	3,545,787	3,554,135	3,557,785
3,521,144	3,545,925	3,554,270	3,557,818
3,522,264	3,547,688	3,554,287	3,557,999
3,522,340	3,547,696	3,554,388	3,558,055
3,522,599	3,548,487	3,554,417	3,558,139
3,523,864	3,548,911	3,554,460	3,558,299
3,527,840	3,549,027	3,554,522	3,558,444
3,528,317	3,549,294	3,554,673	3,558,510
3,529,282	3,549,542	3,554,898	3,558,635
3,529,298	3,549,640	3,554,908	3,558,779
3,529,921	3,549,786	3,554,944	3,558,898
3,530,132	3,549,877	3,555,121	3,558,969
3,530,241	3,550,667	3,555,203	3,559,122
3,535,083	3,550,736	3,555,215	3,559,489
3,536,136	3,550,879	3,555,661	3,559,583
3,536,219	3,551,477	3,555,882	3,559,585
3,538,973	3,551,709	3,556,019	3,560,320
3,539,555	3,551,730	3,556,047	3,560,410
3,540,028	3,551,740	3,556,066	3,560,417
3,541,157	c,551,781	3,556,123	3,560,520
3,541,663	3,552,484	3,556,302	3,560,550

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF APRIL 20, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	12-01-69
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-22-69
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-04-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	1-26-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-03-69
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	8-17-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-01-69
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-02-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-03-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	1-05-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	6-03-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	1-23-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	12-10-69
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	1-02-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	5-07-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	1-06-70

Expiration of patents: The patents within the range of numbers indicated below expire during May 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 2,677,129 to 2,679,644, inclusive
Plant Patents ..... Numbers 1,274 to 1,281, inclusive

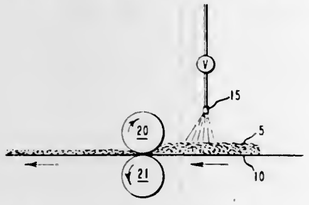
DEFENSIVE PUBLICATIONS

MAY 11, 1971

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent Office makes no assertion as to the novelty of the disclosed subject matter.

T886,010
PROCESS FOR DISTRIBUTING AQUEOUS DISPERSIONS THROUGH A PNEUMACEL BATT
Robert L. Craven and John F. Hesselberth, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Feb. 3, 1970, Ser. No. 8,372
Int. Cl. B44d *1/44*
U.S. Cl. 117—65.2
1 Sheet Drawing. 8 Pages Specification



A process for uniformly distributing an aqueous dispersion of a thermoplastic polymeric binder composition through the thickness of a pneumacel-fiber batt. The preferred pneumacel fibers are low density, closed-cell foam fibers of polyethylene terephthalate containing 6–40 grams of an impermeant inflatant, such as perfluorocyclobutane, per 100 grams of polymer. The preferred dispersion composition comprises 40 parts ethylene/vinyl acetate copolymer (24–26% vinyl acetate), 40 parts water, and 20 parts diammonium phosphate. The process comprises (1) applying the aqueous dispersion to the pneumacel-fiber batt until the weight of the batt is increased by between 25 and 250 percent, (2) compressing the wetted batt, preferably by passing it through the nip of two rolls, until the ratio of the height of the compressed batt to the calculated height of the uncompressed batt is between about 0.4 and 0.6, and (3) releasing the compressive forces from the batt.

T886,011
SURFACE STATIC REDUCTION
Leon Edward Wolinski, Buffalo, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Feb. 3, 1970, Ser. No. 8,418
Int. Cl. B44d *5/04*
U.S. Cl. 117—46
No Drawing. 8 Pages Specification

A process for reducing the surface static level of a thermoplastic packaging material by applying a coating of ionizable liquids having a specific conductance of at least 1×10^{-4} mhos. Optionally, the surface of the thermoplastic packaging material can be pretreated prior to coating to increase the surface polarity thereby increasing the degree of ionization of the coating liquid when applied. Low surface static improves the adhesion of printing inks, minimizes dust attraction, and reduces the tendency for sheets of the packaging material to adhere to one another.

Useful thermoplastic packaging materials include polyvinyl chloride; polystyrene; polyolefins, such as polyethylene and polypropylene; as well as polyesters, such as polyethylene terephthalate. Useful ionizable coating liquids include water; alcohols having 1 to 4 carbon atoms, such as methanol, ethanol, propanol and butanol; glycols, such as propylene glycol; fluorocarbons which are liquid at room temperature; and solutions of ionizable salts. Preferred ionizable coating liquids are (a) water or (b) an aqueous solution of zinc chloride and an alkyl aryl polyethylene glycol ether, each present on the surface of the thermoplastic packaging material in an amount of about 0.11 to 0.034 mg./ft.^{2} based on the dry weight of each of the components.

A typical process sequence comprises:

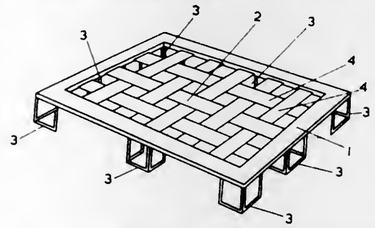
(A) Subjecting a thermoplastic packaging material to a surface pretreatment such as

(1) an electrical discharge in air, oxygen, nitrogen or chlorine of at least about 3,000 to 8,000 volts and 3 to 10 kilocycles, a watt density greater than about 30 watts per square inch with an electrode gap of about from 40 to 50 mils, or

(2) a reducing flame of a gaseous mixture of hydrocarbon fuel, oxygen and nitrogen having a fuel equivalency ratio of about from 1.05:1.25 and an oxygen ratio of about 2.78 for a period of 0.01 to 0.05 second; and

(B) Coating the pretreated surface by means including spraying, nip or doctor roll coating, or, preferably, by direct condensation, i.e., bringing the film surface into contact with the vapor of the ionizable coating liquid.

T886,012
PALLETS
William Bruce Ian Small, Welwyn Garden City, England, assignor to Imperial Chemical Industries Limited, London, England
Filed Apr. 27, 1970, Ser. No. 32,155
Claims priority, application Great Britain, May 5, 1969, 22,709/69
Int. Cl. B65d *19/18*
U.S. Cl. 108—51
1 Sheet Drawing. 5 Pages Specification



Pallets in which the load-bearing surfaces consist of interwoven bands of thermoplastic material mounted within a frame are disclosed. The interwoven bands are of a high tensile material such as tapes of polypropylene or high density polyethylene having the direction of the orientation of the molecules of the material along the axis thereof. Another suitable material is a strip consisting of fibers of polyethylene terephthalate embedded in a matrix

of polyethylene. The frame supporting this interwoven band of plastic is of a light weight material such as, for example, tubular metal or another thermoplastic material. If a thermoplastic material is selected, foamed polypropylene is preferred for its strength and light weight. The woven load-bearing surface may be fitted within such a plastic frame by heat-sealing the strip to the frame or, with either metal or thermoplastic material, the ends of the load-bearing surface may be looped around the frame member and the material sealed to itself to secure each band to the frame.

The underside of the frame may be conveniently fitted with supports to receive the forks of a fork lift truck. Pallets thus produced are strong enough to withstand both the loads which they support and the rough handling to which they are subjected.

T886,013
TWO-PHASE GLASS SYSTEMS AND RESISTOR COMPOSITIONS CONTAINING THE SAME
Kenneth E. Schubert, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Continuation of application Ser. No. 679,525, Oct. 3, 1967. This application July 8, 1970, Ser. No. 56,156
Int. Cl. H01b *1/02*
U.S. Cl. 252—514
No Drawing. 11 Pages Specification

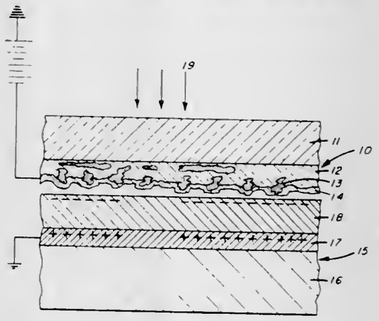
The particular two-phase glass system is composed of 50–70% by weight of a high melting glass and 30–50% of a low melting glass. Resistor compositions composed of finely divided noble metals and the two-phase glass system are produced, and when fired will yield smooth resistors having low contact resistance and low noise value.

T886,014
GELATIN WITH IMPROVED CHEMICAL SETTING PROPERTIES
Thomas Karl Dykstra, % Eastman Kodak Co., Kodak Park Division, Rochester, N.Y. 14650
Filed Aug. 3, 1970, Ser. No. 60,710
Int. Cl. G03c *1/02*
U.S. Cl. 96—114.8
No Drawing. 19 Pages Specification

Gelatin, modified by reacting it with diketene and thereafter with a suitable aldehyde, like formaldehyde, possesses desirable properties including ultra-rapid chemical setting. Particularly effective modified gelatin comprises less than all, and preferably up to about 50% of its primary amine functions converted to its acetoacetamido function and photographic emulsions and layers comprising said modified gelatin are useful in photography and in rapid coating of multilayer elements.

Silver halide emulsions and elements containing said modified gelatin can be chemically sensitized. e.g. with noble metal sensitizers alone or in combination with sulfur or selenium sensitizers. They can contain spectral sensitizers, incorporated color-forming couplers, incorporated developing agents, antifoggants, hardeners, plasticizers, coating aids, vinyl polymers, and other suitable photographic addenda such as described in U.S. Pat. 3,297,446 of Dunn issued Jan. 10, 1967 (columns 4 to 9).

T886,015
FLEXIBLE TRANSPARENT CONTACT CHARGING ELEMENT FOR ELECTROPHOTOGRAPHY
Richard W. Stahr and William W. Rees, both of 1669 Lake Ave., Rochester, N.Y. 14602
Filed Nov. 2, 1970, Ser. No. 85,943
Int. Cl. G03g *13/00*
U.S. Cl. 250—49.5
1 Sheet Drawing. 13 Pages Specification



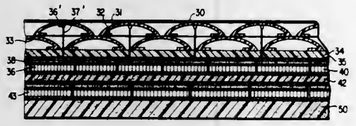
A substantially transparent, flexible element for contact charging of photoconductors is provided with a rough surface by incorporating inert granules or bead-like particles in a binder resin coated on a flexible, transparent film. Over the binder layer or imbibed into it is a semiconducting material such as cuprous iodide. The rough surface has a Sheffield Smoothness Value of from 20 to 200 and an electrical resistance of less than 10^8 ohms/square. This rough surface controls the air gap spacing during the charging cycle when the charging film and the photoconductive element are oriented in a face-to-face mode to place a charge on the photoconductor. Such space has optimum dimensions of from 1 to 40 microns to permit gaseous ionization to occur. The element can be used for charging photoconductive elements having rough or smooth surfaces.

PATENTS

GRANTED MAY 11, 1971

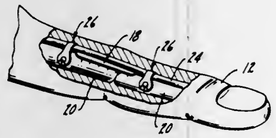
GENERAL AND MECHANICAL

3,577,836
ARMORED GARMENT
Raymond M. Tamura, 3253 N. Nimitz Hwy., Honolulu, Hawaii 96819
Continuation-in-part of application Ser. No. 545,446, Apr. 26, 1966, now abandoned. This application Nov. 12, 1969, Ser. No. 875,770
Int. Cl. F41h *1/02*
U.S. Cl. 2—2.5 **14 Claims**



A laminated armor construction formed of a plurality of layers adapted to protect against missiles by a combination of projectile deflection, diffusion of forces, dissipation of energy into heat, modification of force vectors and adsorption of kinetic energy. A first layer of elliptical plastic plates causes deflection with the energy dissipation and adsorption being achieved by underlying layers of foam plastic, and a metal honeycomb filled with epoxy.

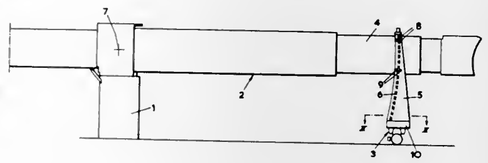
3,577,837
SUBDERMAL TENDON IMPLANT
Karl F. Bader, Jr., Chicago, Ill. (2016 Bradley Road, Rockford, Ill. 61107)
Filed Apr. 30, 1968, Ser. No. 725,423
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **7 Claims**



A subdermal tendon implant for use in repairing and reconstructing tendons which is compatible with the human cellular structure and includes the process of making the implant. The subdermal implant is resistant to degeneration and substantially eliminates adhesions allowing full range of motion after healing and includes in its structure a flexible sheeting of chemically inert material sculptured to a desired size and shape and means for anchoring the implant to prevent it from moving axially along the tendon.

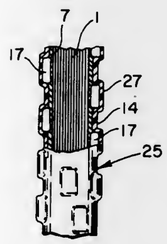
3,577,838
AIRPORT GANGWAY
Nicolaas Gradus Jan Willem Van Marle, Dordrecht, Netherlands, assignor to Aviolanda Maatschappij voor Vliegtuigbouw N.V., Papendrect, Netherlands
Filed Oct. 7, 1968, Ser. No. 767,922
Claims priority, application Netherlands, Oct. 6, 1967, 67/13,617
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 **3 Claims**

A telescoping airport gangway incorporating means for adjusting its vertical position, for lengthening and shortening it,



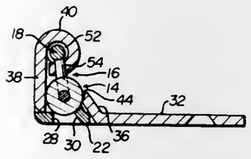
and for pivoting it about its rear end.

3,577,839
BRUSH AND BRUSH MATERIAL
Vernon K. Charvat, Bay Village, and Robert E. Jarvi, Judson, Ohio, assignors to The Sherwin-Williams Company
Filed June 27, 1968, Ser. No. 740,848
Int. Cl. A46b *13/00*
U.S. Cl. 15—179 **18 Claims**



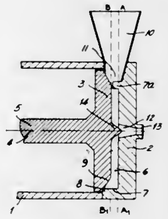
Brush material and brushes utilizing the same, particularly power driven rotary brushes, in which the brush bristles have a central core and a thin outer plastic coating, with granular abrasive preferably secured to such core beneath such coating.

3,577,840
SELF-HOLDING HINGE
Harry P. Buberniak, 12372 Devoe, Southgate, Mich.
Filed Mar. 24, 1969, Ser. No. 809,710
Int. Cl. E05d *11/08*
U.S. Cl. 16—142 **4 Claims**



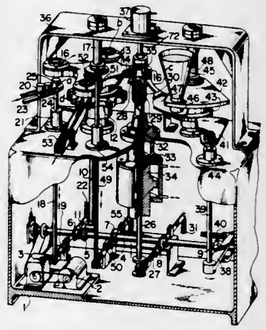
A self-holding hinge of the type wherein a resilient detent-like structure is incorporated into a hinge to resiliently hold or retain the hinge in its closed position.

3,577,841
EXTRUDERS WITH ROTATING PLATE
Claude Ledoux, Massy, and Bernard Neuville, Versailles, France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France
Filed Sept. 11, 1968, Ser. No. 759,087
Claims priority, application France, Sept. 14, 1967, 120,988
Int. Cl. B29f *3/012, 1/022*
U.S. Cl. 18—12C **19 Claims**



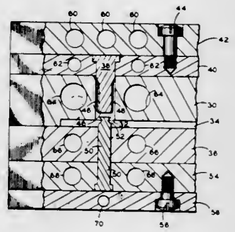
A rotating plate extruder in which at least one of the faces of the plates is formed with grooves extending tangentially to a circle concentric with the axis of the plate to enhance use with lubricated plastic materials.

3,577,842
APPARATUS FOR COMPRESSION MOLDING A POWDER WITHIN A CONTAINER
Miyoji Nakai, Neyagawa-shi; Akira Nakajima, Hirakata-shi; Makoto Watanabe, Osaka, and Toshio Sanukiya, Izumisano-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed July 2, 1969, Ser. No. 838,486
Claims priority, application Japan, July 4, 1968, 43/47682
Int. Cl. B29c *3/00;* **B30b** *11/10*
U.S. Cl. 18—20 **4 Claims**



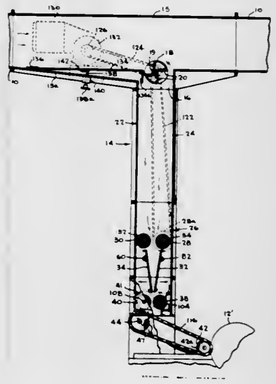
An apparatus for compression molding a powder within a container, which is operative in such a manner that empty containers successively loaded on an intermittently driven rotary member at a loading station of the apparatus with its open end facing downwardly are carried one after another to a molding station where a compression-moldable powder previously charged in a cavity die from a hopper is displaced into and compression molded within said container into a prescribed shape by a relative movement of said container which is held immovably, and a core die and a sleeve surrounding said core die, and upon completion of the compression molding said container is further carried by said rotary member to an unloading station with the shaped mold of said powder formed therein where it is removed from the rotary member.

3,577,843
APPARATUS FOR CONTROLLING BRISTLE DEFLECTION
Louis F. Kutik, 8720 S. W. 23rd Place, Fort Lauderdale, Fla., and Erich W. Gronemeyer, 2100 S. Ocean Lane, Fort Lauderdale, Fla.
Filed Apr. 9, 1969, Ser. No. 822,819
Int. Cl. B29c *11/00*
U.S. Cl. 18—42 **15 Claims**



A method and apparatus for molding bristled products in a manner such that the degree of deflection or nondeflection of bristles if positively controlled. The apparatus includes a mold having a backing part and a chase part forming a cavity and a pin having one or more flutes in a bore in the chase part communicating with the cavity. The cross-sectional shape of the flute and the rates at which heat is withdrawn from different sides of the bristle are specifically selected and controlled to produce deflection or inhibit deflection of the bristle or bristles as desired. Certain dimensions at the base of the bristles are also controlled to prevent distortion of bristles.

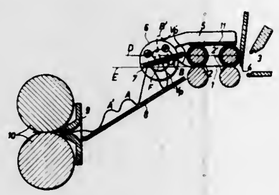
3,577,844
APPARATUS FOR PREPARING FIBROUS MATERIAL FOR A CARDING MACHINE
Jack D. Towery, Lubbock, Tex., assignor to Continental/Moss-Gordin, Inc., Prattville, Ala.
Continuation of application Ser. No. 719,500, Apr. 8, 1968, now abandoned. This application Oct. 21, 1969, Ser. No. 868,240
Int. Cl. D01g *15/40*
U.S. Cl. 19—105 **14 Claims**



An apparatus for preparing cotton after it has been removed from a compressed bale and without the use of the picker, the picker lap, the lap handling, the creeling and other operations sometimes employed prior to delivery to the carding machine. In the present method the fiber is supplied in very small, open tufts carried by air into a rectangular flue which passes over or into a smaller round or polygonal shaped flue across a series of carding machines, where the

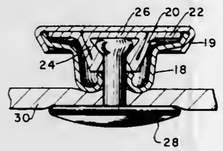
fibers are loosely collected and fed through a bellows action mechanism which alternatively compresses and releases, removing a substantial portion of the air and allowing the fibers to fall by gravity into any spaces formerly occupied by air producing a uniform batt.

3,577,845
APPARATUS FOR GUIDING A FLEECE
Hansulrich Eichenberger, and Peter Schwengeler, Winterthur, Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland
Filed Aug. 23, 1968, Ser. No. 754,800
Claims priority, application Germany, Sept. 6, 1967, M75446
Int. Cl. D01g *19/18*
U.S. Cl. 19—231 **13 Claims**



A web guide plate is positioned above the web tray so as to direct the web onto the tray after passing from the detachment rollers. The guide plate is spaced in the plane of the nip between the detachment rollers and includes an inclined portion which serves to direct the web onto the tray. The amplitude of the web undulations is reduced so as to avoid any breaks in the fibers at the crests of the peaks. the annular member in another cycle of operation to cut the slice. Movement of the support member is also controlled by circuitry interconnected with that for controlling movement of the pivotal members.

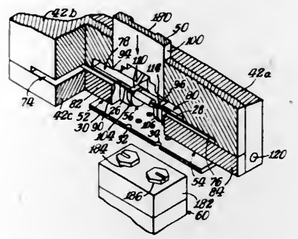
3,577,846
THREE-PIECE TACK BUTTON
Badger Perrin, Roxbury, Conn., assignor to United-Carr Incorporated, Boston, Mass.
Filed June 30, 1969, Ser. No. 837,578
Int. Cl. A44b *1/42*
U.S. Cl. 24—95 **1 Claim**



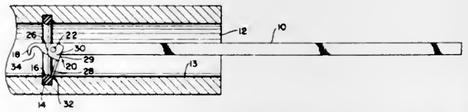
This is a three-piece tack button having a unitary combination vise and anvil. The combination vase and anvil is double walled and has a continuous, uninterrupted exterior wall.

3,577,847
COMPONENT PART INSERTER FOR CIRCUIT BOARD
Ronald A. Scranton, 1025 E. Thompson Ave., Hoopeston, Ill.
Filed Mar. 17, 1969, Ser. No. 807,541
Int. Cl. H05k *3/30*
U.S. Cl. 29—203 **15 Claims**

In a machine for attaching electrical components to a circuit board, wherein each of the electrical components has a body and a pair of generally aligned oppositely extending leads, and wherein the circuit board has preformed holes arranged in pairs to receive the leads of the respective electrical components, a reciprocable ram member cooperates with suitable lead-cutting dies and lead-forming cam means in cutting the leads of the respective electrical components to predetermined lengths, forming the leads so as to permit the leads to be driven through a selected pair of holes in the circuit board, and driving the leads therethrough.



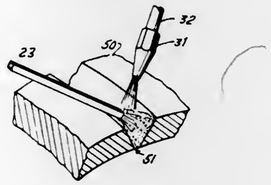
3,577,848
METHOD OF EXTRACTING O-RINGS FROM RECESSED GROOVES
Robert C. Mengle, 21330 Center Ridge Road, Cleveland, Ohio
Filed Dec. 9, 1968, Ser. No. 782,087
Int. Cl. B23p *19/02*
U.S. Cl. 29—427 **6 Claims**



A tool for extracting O-rings from grooves which are recessed from the mouth of an opening. It includes an elongated rod with a hook on the forward end and a pivotally attached tongue adjacent the hook, the tongue being adapted to pivot from an open position with the tongue extending transverse to the rod to a closed position which substantially closes the opening in the hook. In open position, the tongue is adapted to slide into the recessed groove adjacent the O-ring; the pivoting to a closed position serves to pry the O-ring out of the groove and grasp the ring between the tongue and the hook.

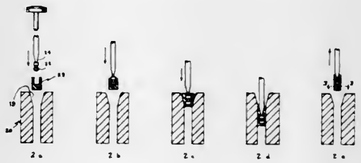
A method of extracting O-rings from recessed grooves by use of a tool including a rod having a hook and a cooperating pivotable tongue at its forward end. The tongue is opened and the forward end of the rod is inserted into an opening. Within the opening is an O-ring positioned in a groove, the groove being recessed from the mouth of the opening. The tongue is pushed laterally into the groove beside the O-ring and the tool is then retracted toward the mouth of the recess. The retraction serves to close the tongue, pry the O-ring out of the groove and clamp the O-ring between the hook and the tongue.

3,577,849
METHOD AND MATERIALS FOR WELDING
Dan T. Roberts, Corsicana, Tex., assignor to Oil City Iron Works, Corsicana, Tex.
Division of Ser. No. 599,159, Dec. 5, 1966, Pat. No. 3,479,230, filed Apr. 14, 1969, Ser. No. 844,683
1969, Ser. No. 844,683
Int. Cl. B23k *31/02, 35/36*
U.S. Cl. 29—495 **12 Claims**



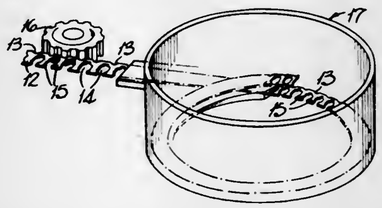
This application discloses a method and materials including a welding rod and flux for welding nodular cast iron.

3,577,850
METHOD OF FORMING SEALS
Rano J. Harris, Sr., Baton Rouge, La., assignor to Precision Sampling Corporation
Filed Sept. 26, 1968, Ser. No. 762,791
Int. Cl. B21d *39/00;* **B23p** *11/00*
U.S. Cl. 29—510 **8 Claims**



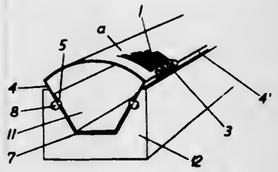
A method, and the apparatus formed by encapsulating and stress forming a thermoplastic material upon a male member, e.g., the needle or plunger of a syringe, or both, to provide a durable and effective leakproof seal when inserted within enclosing walls defining an opening of restricted diameter. A portion of the said male member is capped with an oversized thermoplastic material, the cap is then reduced in size to correspond to the diameter of the member with which it is to be mated in forming the seal, and then heated up to or just below the softening temperature of the thermoplastic material, generally up to about 425° F., and preferably to about 300° F. The heat stressed member, which is characterized as having very thin layers or films of the stress formed thermoplastic covering the external surface of the member, can then be inserted into snug fit within the mating bore, e.g., the barrel of a syringe, and the tight fit will endure because of the elastic memory of the material by virtue of which it tends to expand to its former size and shape thereby pressing against the enclosing sidewalls forming the bore.

3,577,851
METHOD OF MAKING DYNAMOELECTRIC MACHINES
John Stanley Detheridge, Birmingham, and John William March, Hanworth, England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Mar. 11, 1969, Ser. No. 806,130
Claims priority, application Great Britain, Mar. 18, 1968, Aug. 9, 1968, 12895/68;38067/68
Int. Cl. H02k *15/00*
U.S. Cl. 29—596 **3 Claims**



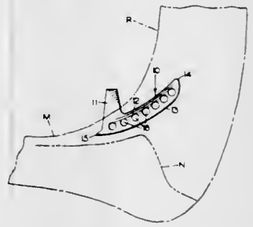
A method of forming a stator assembly for a dynamoelectric machine includes the steps of forming a continuous metal strip with stator slots along one peripheral edge and gear teeth along the other peripheral edge and then using a gear wheel engaging the gear teeth to drive the strip onto a former to coil the strip helically. In a modification, in order to produce a yoke or a stator assembly for a dynamoelectric machine a continuous metal strip is formed with gear teeth along one peripheral edge thereof and a gear wheel is engaged with the gear teeth and drives the strip onto a former to coil the strip helically to produce the yoke or stator assembly. The gear teeth in the strip can be the stator slots where a stator assembly is to be produced, or can be specially provided gear teeth where a yoke assembly is to be produced.

3,577,852
CUTTING HEAD FOR MOTOR-DRIVEN SHAVERS
Bodo Futterer, Luzern, Switzerland, assignor to The Gillette Company, Boston, Mass.
Filed Aug. 1, 1968, Ser. No. 749,364
Int. Cl. B26b *19/02*
U.S. Cl. 30—43.92 **2 Claims**



The undersurface, or at least the undersurface adjacent the openings in the movable cutting head of a dry shaver are coated with an antiadhesive material such as polytetrafluorethylene.

3,577,853
DENTAL IMPLANT AND METHOD OF MOUNTING THE SAME
Harold D. Roberts, 2717 N. E. Knott St., Portland, Oreg.
Filed July 22, 1969, Ser. No. 843,579
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 **4 Claims**

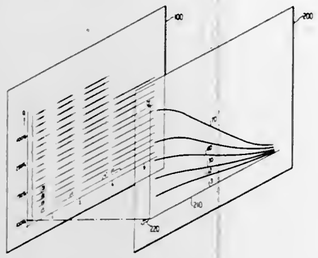


An implant designed to be mounted specifically in the ramus or retromolar portion of the mandible or jawbone, having an elongated main body carry a post extending up from the forward end of the main body and passing up through the epithelium; the main body of the implant being inserted into a partial incision made in the bone in a direction extending longitudinally and rearwardly, and driven in through and rearwardly beyond the incision and in beneath the top surface of the ramus; the main body of the implant extending rearwardly spaced a safe distance above the alvealor nerve and positioned between the signal lingual and buccal cortical plates of the ramus.

3,577,854
METHOD OF REPRESENTING THE DIAL SETTINGS OF AN ELECTRONIC YARN SMOOTHER
Ernst Felix, Uster, Switzerland, assignor to Zellweger Ltd., Uster, Switzerland
Filed Dec. 24, 1968, Ser. No. 786,679
Int. Cl. G06g *1/00*
U.S. Cl. 33—1 **7 Claims**

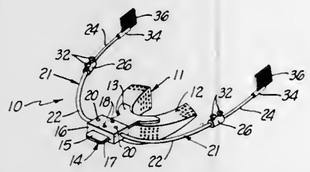
The dial settings of a yarn smoother, required to remove a preselected field of flaws, are determined by plotting a field of yarn flaws in a coordinate system; plotting a family of limit curves, each representing the locus of the flaws extracted by the yarn smoother when set at a preselected fixed reference length dial setting; placing the family of limit curves over the field of flaws; and shifting the limit curves, while maintaining coincidence of the ordinate axes of the field of flaws and the limit curves, to align one of said limit curves, as nearly as possible, with the flaws to be extracted. After a single limit curve is properly aligned with the flaws to be extracted, the

proper dial settings are (1) the reference length corresponding to the aligned limit curve and (2) the value of the or-



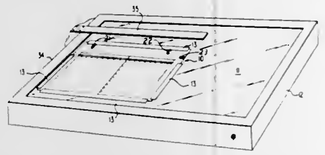
dinate of the field of flaws graph intersected by the origin of the limit curve graph.

3,577,855
JAW HINGE AXIS LOCATOR
Lloyd Baum, 11460 Aster St., Loma Linda, Calif.
Filed Mar. 17, 1969, Ser. No. 807,824
Int. Cl. A61b *5/10*
U.S. Cl. 33—174 **10 Claims**



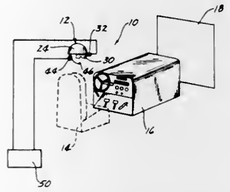
A jaw hinge axis locator having a stiff wire frame with two curving segments which extend around the sides of a dental patient's face from the handle of a mouthpiece mounted on his lower jaw, and a pair of dead soft wires connected to the outer ends of the curving segments of the frame. The dead soft wires terminate near the ends of the patient's jaw hinge axis, and have flat squares of clear plastic, with grid markings, attached to their outer extremities. Each plastic square has an easily observable center of rotation which pinpoints the patient's jaw hinge axis when he moves his lower jaw.

3,577,856
APPARATUS FOR OFFSET PRINTING
Edward R. Updegraff, 4611 Harvard Road, College Park, Md. 20740
Division of Ser. No. 618,886, Feb. 7, 1967, Pat. No. 3,451,337, filed Fev. 25, 1969, Ser. No. 816,457
Int. Cl. B41b *1/00*
U.S. Cl. 33—184.5 **12 Claims**



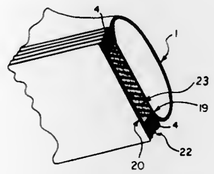
An apparatus for preparing straightedge printing plates for use in an offset printing system, including a light table unit having a light surface with a plurality of guide lines formed thereon in fixed relation to three flat stops mounted on and projecting upwardly from the light surface and positioned to engage and accurately orient a sheet of light-blocking paper over the guide lines in the production of flats used to prepare the printing plates. An assembly surface is provided with three plate guides for positioning a printing plate, and three flat guides are positioned in spaced relation to the plate guides for accurately positioning flats in superimposed relation on a plate which has been positioned by the plate guides. A suitable clamp is provided to releasably retain a flat in superimposed relation on a plate on the assembly surface.

3,577,857
DRIVER TRAINER SIMULATOR HEAD UNIT
Donald H. Schuster, and Russ S. Vaught, Ames, Iowa, assignors to Iowa State University Research Foundation, Ames, Iowa
Filed Oct. 31, 1968, Ser. No. 772,082
Int. Cl. G09b *9/02*
U.S. Cl. 35—11 **8 Claims**



A driver trainer unit having a head unit including a blinder operable between raised and lowered positions, a speaker operative with the blinder and actuated by a computer responsive to the driving actions of the student operating the driver trainer simulator in response to driving situations projected on a screen. A solenoid may be used to move the blinder between raised and lowered positions. A microphone may also be provided for receiving the audible responses from the student when reacting to a simulated crash situation.

3,577,858
FOOTWEAR
Curt E. Kaufman, Waynesville, N.C., assignor to Ro-Search, Incorporated, Waynesville, N.C.
Continuation-in-part of application Ser. No. 794,333, Jan. 27, 1969, which is a division of application Ser. No. 521,247, Jan. 14, 1966. This application July 30, 1969, Ser. No. 846,019
Int. Cl. A43b *00/00*; **A43d** *9/00*
U.S. Cl. 12—2.5 **3 Claims**

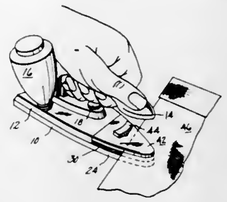


Footwear such as shoes, boots, etc. having a welt at its lower margin to which a prepared sole, usually of sheet stock, is fastened having a ribbon of elastomeric material molded and cured in situ along the inner perimeter of the welt so as to provide a stepless transition inside of the shoe from the upper to the sole. Such shoes having soles of soft material, such as microcellular elastomer, and also a stabilizing insert and the ribbon of elastomer is molded to secure the insert in its desired location to provide the stepless transition from the inside of the upper to the sole.

3,577,859
COMBINATION FLATIRON AND INTEGRAL CREASER
William E. Davidson, Ontario, Calif., assignor to General Electric Company
Filed Nov. 20, 1969, Ser. No. 878,323
Int. Cl. A47j *51/00*
U.S. Cl. 38—71 **10 Claims**

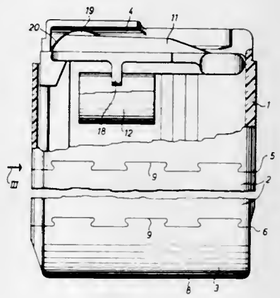
A combination electrical flatiron and integral fabric creaser having a soleplate through which steam is discharged

for normal ironing. A surface of the iron body opposite the soleplate forms a second ironing surface in the form of a



fabric creaser with steam supply selectively to the creaser when in use all within the iron envelope.

3,577,860
MAGAZINE FOR FIREARMS
Leopold Jestrabek, Oberndorf (Neckar), Germany, assignor to Heckler & Koch GmbH, Oberndorf (Neckar), Germany
Filed July 8, 1968, Ser. No. 743,158
Claims priority, application Germany, May 4, 1968, P 17 03 342.0
Int. Cl. F41c *25/02*
U.S. Cl. 42—50 **8 Claims**



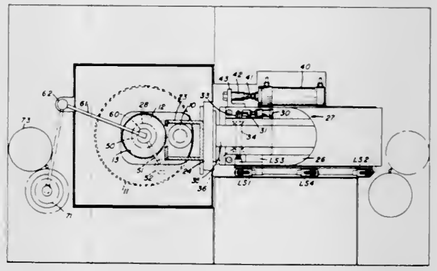
A magazine consisting of plastic upper and lower components transversely split in the area of the sidewalls. The upper component comprises the magazine lips and the lower component comprises the magazine bottom. The follower spring is a rolled spring having a wound portion which engages the underside of the follower and the free end of which is secured to the inside of the upper magazine component. The magazine components are provided with relieved teeth for positive engagement at their adjoining ends; the magazine components may be provided with reinforcements at their adjoining ends, which serve simultaneously as stops by means of the magazine bearing against the end of the magazine chamber.

ERRATUM

For Class 47—38 see:
Patent No. 3,578,482

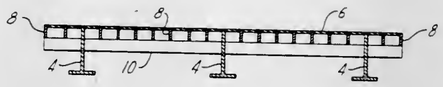
3,577,861
TRANSFER DEVICE FOR CUTTING APPARATUS
David L. Bender, Rochester, and Robert E. Moore, Henrietta, N.Y., assignors to Kayex Corporation, Rochester, N.Y.
Filed Apr. 7, 1969, Ser. No. 822,816
Int. Cl. B24b *7/20*
U.S. Cl. 51—73 **15 Claims**

A device for retrieving a thin slice or wafer of material that has been cut from a billet and for transferring it to a storage receptacle comprises two pivotal members. A first pivotal member retrieves the slice after cutting and moves it along one side of an annular cutting member into a transfer position relative to the inner diameter of the annular member. A second pivotal member takes the slice at the transfer position and moves it axially and then in an arcuate path to a storage receptacle where it is released. The slice of material is retained on the pivotal members by suction. Suitable circuitry controls the application of the suction in proper timed relation to the movement of the pivotal members. A movable support member for the billet is also pivotally mounted so it can move the billet into a position in which it is spaced from



the annular member on movement of the latter to its home position, thereby preventing damage to its exposed surface by contact with the annular member. In its home position the billet is moved axially to establish the thickness of the slice to be cut next and then radially relative to the annular member in another cycle of operation to cut the slice. Movement of the support member is also controlled by circuitry interconnected with that for controlling movement of the pivotal members.

3,577,862
COMPOSITE PRECOMPRESSED GRATING STRUCTURE
Henry P. Cerutti, Mount Lebanon, Pa., assignor to Blaw-Knox Company, Pittsburgh, Pa.
Filed July 12, 1968, Ser. No. 751,663
Int. Cl. E01c *9/10*; **E04c** *2/42*; **F16s** *3/08*
U.S. Cl. 52—223 **6 Claims**

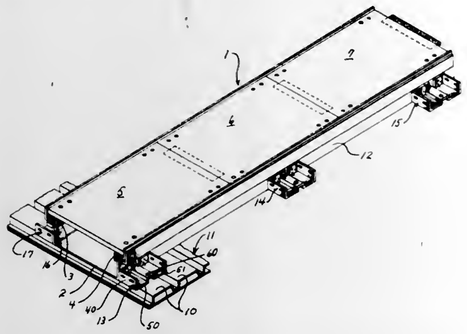


This invention provides a novel floor system which has outstanding advantages in structures, such as powerhouses, nuclear power plants, chemical plants and other such large structures whereby an adequate floor is provided with a sizeable reduction in deadweight. The deadweight design of these structures exceeds the liveweight capacity designs due to the fact that a minimum number of personnel are involved in the operation os such plants. A grating is provided whereby the weight can be reduced materially and/or the span materially lengthened so that the resulting floor support and columns is also reduced. In addition to the reduction in the weight of members, the number of support members for the new floor design is reduced materially, thereby saving additional weight and cost.

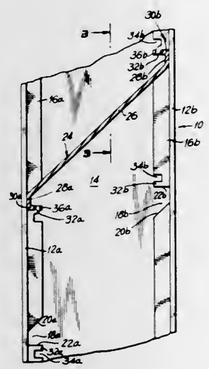
3,577,863
TRENCH DUCT CONNECTING DEVICE WITH VERTICAL ADJUSTMENT MEANS
Frederick W. Hudnall, Vienna, W. Va., assignor to Textron Inc., Providence, R.I.
Filed Aug. 14, 1969, Ser. No. 849,991
Int. Cl. E04f *17/08*
U.S. Cl. 52—220 **4 Claims**

A device for installing trenchduct, the device having a bottom and three upstanding sides, one side securing the device to the trench by being welded thereto, the other two sides being used alternatively for coupling one trench to another

and the bottom being used either to secure the trench to a cellular floor by being welded thereto or alternatively supporting a leveling lug when the trench is used over a concrete floor.



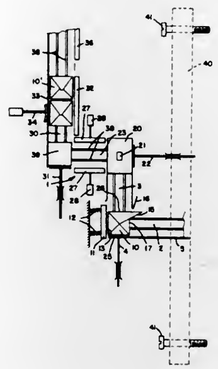
3,577,864
FRAME WITH DEFORMABLE LOCKING MEANS
Louis Sommerfeld, 165 West End Ave., New York, N.Y.
Filed Sept. 29, 1969, Ser. No. 861,781
Int. Cl. E06b *7/08;* **F24f** *13/08*
U.S. Cl. 52—473 **7 Claims**



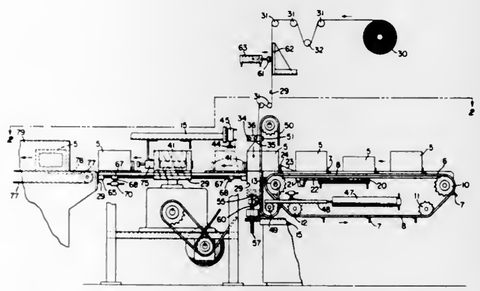
An assembly which includes a frame and an air-guiding panel such as a louver. The frame has a pair of panel-carrying vertical ribs respectively formed with notches while the panel has opposed edge portions of a cross section matching that of the notches and received therein. Each of the ribs of the frame is provided next to its notch with a deformable locking nib while the edge portion of the panel adjacent to the locking nib is formed with a locking cutout. According to the method of the invention after the panel is situated within the notches of the ribs, the deformable locking nib is bent into the locking cutout to remain therein for providing a positive lock between the panel and the frame, thus preventing the panel from snapping or otherwise being removed out of the frame.

3,577,865
WRAPPING MACHINE METHOD
Gottfried M. Hain, Lehen Post Ramerberg an der. Inn, and Wolfgang B. Leonard, Graben Post Ramerberg an der. Inn, Germany, assignors to Alpma Alpenland-Maschinenbaugesellschaft Hain & Co. KG., Rott Inn Rosenheimer Strasse, Germany
Filed May 15, 1967, Ser. No. 638,213
Claims priority, application Germany, May 18, 1966, A52524
Int. Cl. B65b *55/14, 51/12, 63/08*
U.S. Cl. 53—25 **2 Claims**

Method of enclosing an article is a heat-shrinkable foil wrapper by subjecting portions of the wrapping material progressively to heat, beginning with that portion of the material most remote from the closure area, and subjecting the closure area to heat just prior to closure to cause the removal of air.



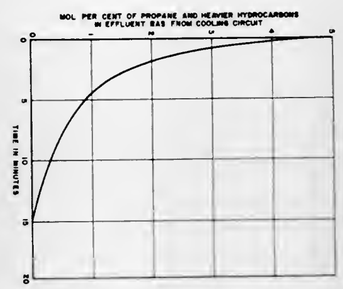
3,577,866
PACKAGING APPARATUS AND PACKAGE
John F. Ehrenfried, Akron, and Charles M. Gardner, Manchester, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Division of Ser. No. 654,858, July 20, 1967, Pat. No. 3,504,476, filed Oct. 13, 1969, Ser. No. 865,795
Int. Cl. B65b *11/40, 53/02*
U.S. Cl. 53—184 **7 Claims**



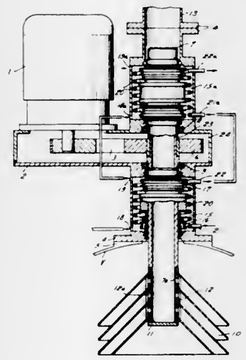
The material to be packaged, referred to herein as the content of a package, may be one or more boxes, or cans on a tray or trays, or a stack of magazines, etc. A series of these, all of the same size or different sizes are fed successively through the apparatus where each is individually wrapped in heat-shrinkable, heat-sealable film to form an open-ended package with the ends of the film overlapped under the package. The overlapped ends of the film are heated and sealed to one another. The entire package is then heated and the film is shrunk tight on the content, and the edges of the film which extended beyond the content are shrunk in over the ends of the content.

3,577,867
METHOD FOR COOLING HEATED ADSORBENT BEDS
Clem A. Barrere, Jr., Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
Filed Aug. 19, 1968, Ser. No. 753,487
Int. Cl. B01d *53/04*
U.S. Cl. 55—62 **15 Claims**

Method and apparatus for cooling a heated regenerated bed in a gas sorption process. Cooling gas is continually circulated through the heated bed in a closed cooling circuit; by maintaining a positive back pressure on the cooling circuit, no gas is permitted to leave the cooling circuit during the cooling step.

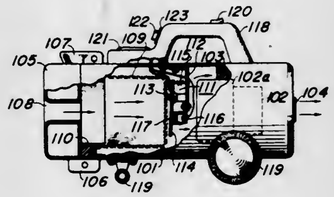


3,577,868
DEVICE FOR SEPARATING FOAM INTO ITS LIQUID AND GASEOUS PHASES
Hans Muller, Im Allmandli, Erlenbach, Zurich, Switzerland
Filed Nov. 5, 1969, Ser. No. 874,102
Claims priority, application Switzerland, Nov. 6, 1968, 16660/68
Int. Cl. B01d *19/00*
U.S. Cl. 55—178 **10 Claims**



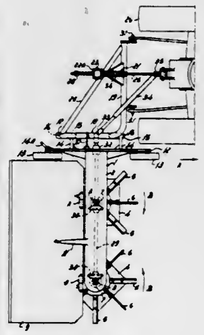
A vessel accommodates material to be processed, including foam, and which material is to be protected against contaminants from the exterior of the vessel. A rotatable shaft extends through an opening in the vessel into the latter and carries within the vessel a foam separator which effects foam separation into the liquid and gaseous phases when the shaft is rotated. A drive engages the shaft exteriorly of and spaced from the opening in the vessel for rotating the shaft. Wall means surrounds the shaft intermediate the opening in the vessel and the drive and forms a chamber about the surrounded portion of the shaft. A pair of sliding ring seals are provided on the shaft closing the chamber with respect to the opening in the vessel as well as with respect to the drive. Means is provided for circulating a flowing medium through the chamber to thereby prevent the passage of contaminants from the drive into the chamber and from the latter through the opening into the vessel.

3,577,869
ELECTRIC VACUUM CLEANER
Tomoyuki Hosokawa, Takarazuka-shi; Toshii Tsugeki, Takatsuki-shi, and Shigeyuki Asanari, Suita-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Aug. 5, 1968, Ser. No. 750,046
Claims priority, application Japan, Aug. 9, 1967, Aug. 9, 1967, Aug. 18, 1967, 42/69344;42/69345;42/71538
Int. Cl. A47l *9/28*
U.S. Cl. 55—361 **6 Claims**



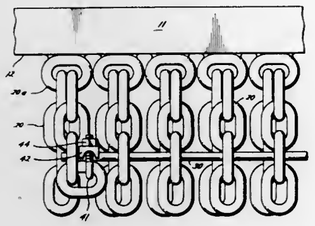
An electric vacuum cleaner in which a thyristor is provided to control the input to an electric motor driving a blower so as to adjust the flow of insucked air. In the cleaner, the thyristor is disposed in the path of airstream through the cleaner casing so that it can be subject to forced cooling, and means responsive to a variation in the pressure or in the airflow is provided to vary the phase corner the gate circuit of the thyristor for controlling the flow of insucked air.

3,577,870
MOWING MACHINES
Cornelis Van Der Lely, 7 Bruschenrain, Zug, Switzerland
Filed Sept. 14, 1967, Ser. No. 668,308
Claims priority, application Netherlands, Sept. 29, 1966, 6613708
Int. Cl. A01d *75/30*
U.S. Cl. 56—6 **31 Claims**



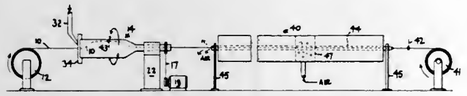
A mowing machine for attachment laterally of a tractor wherein at the side of the mowing elements, viewed in the direction of travel approximately at the same level as the front side of the mowing elements, the mowing machine is supported from the ground so that, in operation, the mowing machine is pivotally connected with the tractor by means of a pivotal shaft extending approximately at right angles to the direction of travel. The mowing machine is pivotally connected to a lateral portion of the shaft for pivotal movement about an axis extending generally in the direction of travel.

3,577,871
CHAIN CURTAIN
Anthony R. Engler, Houston, Tex., assignor to Douglass Industries, Inc., Houston, Tex.
Filed Dec. 16, 1968, Ser. No. 783,806
Int. Cl. A01d *53/08*
U.S. Cl. 56—255 **5 Claims**



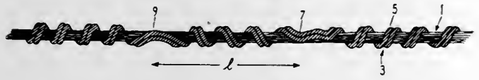
Curtain attached to a mower comprising a plurality of chain elements hanging downwardly from the mower body. Cable means extend horizontally through links near the bottom of the chain elements to provide rigidity.

3,577,872
METHOD AND APPARATUS FOR COATING TEXTILE MATERIAL
Warren W. Drummond, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed June 2, 1969, Ser. No. 829,521
Int. Cl. D01h *13/30*
U.S. Cl. 57—35 **13 Claims**



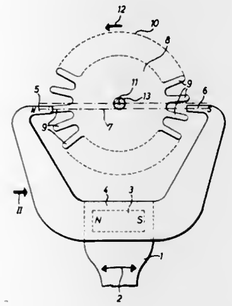
Textile material such as strand, yarn, or cord is simultaneously false twisted and impregnated while in a slack (low-tension)condition by feeding the textile material in slack condition into one end of a rotating cylinder containing the coating and withdrawing it from the other end. The textile material in untwisted form and the coating are held against the interior of the rotating cylinder by centrifugal force and the coating impregnates the textile material while subjected to such force. The impregnated textile material passes through a heated tube to dry the coating on the textile material. A uniformly coated twisted textile material wrapped in low tension on a takeup package is produced.

3,577,873
NOVEL CORE YARNS AND METHODS FOR THEIR MANUFACTURE
Graham Thomas Waters, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England
Filed Mar. 10, 1969, Ser. No. 805,598
Claims priority, application Great Britain, Mar. 27, 1968, Aug. 26, 1968, 14764/68;40616;40617;40618
Int. Cl. D02g *3/38, 3/04, 3/28*
U.S. Cl. 57—144 **16 Claims**



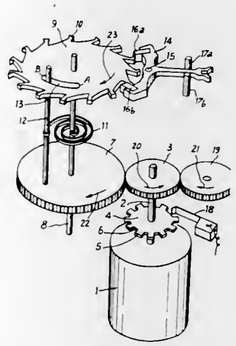
Core yarns having a set false twisted core and reversing helical wrapping and processes for their manufacture involving feeding at least two continuous filamentary components having differing extensibility under a given stress to a false twisting machine.

3,577,874
ELECTRIC CLOCKS WITH MAGNETIC DRIVES
August Mutter, Schwenningen (Neckar), Germany, assignor to Muller-Schlenker, Schwenningen (Neckar), Germany
Filed June 21, 1968, Ser. No. 738,977
Claims priority, application Germany, June 27, 1967, M74541
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 **13 Claims**



An electric clock employs a mechanical oscillator which is driven at its natural frequency and which contains a magnetic drive for driving the clock. The magnetic drive contains a nonmagnetized ferromagnetic pole spider, which on its circumference has disposed a single ring of magnetic poles. The poles of the magnetic drive which interact with the spider poles are assymmetrically positioned with respect to poles on opposite sides of the circumference of the pole spider.

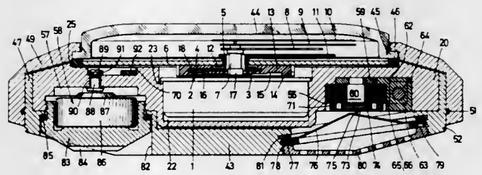
3,577,875
CLOCKWORK MOVEMENT CASED BY A ROTARY STEPPING ELECTRIC MOTOR HAVING TWO MOTIVE PHASES SUCCEEDING ONE ANOTHER IN TIME
Georges Stcherbatcheff, Paris, and Claude Houdet, Besancon, France, assignors to Societe de Recherches en Matiere de Micromoteuss Electriques Socrem, Paris, (Seine), France
Filed Jan. 15, 1969, Ser. No. 791,330
Claims priority, application France, Jan. 17, 1968, 136,305
Int. Cl. G04c *3/04*
U.S. Cl. 58—28 **7 Claims**



The invention broadly relates to clockwork movements controlled by an electric motor. More particularly, the instant invention provides a clockwork movement which avoids the use of a power storage spring, said clockwork movement including a rotary stepping motor having a static torque with motive effect for any angular position of its rotor in which the torque due to the current is annuled upon change of sign.

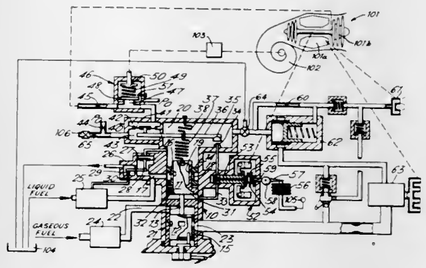
A synchronism between the running of the escapement and that of the motor may then be obtained, provided that gear means, connecting the motor to the escape wheel, have such a ratio that a half-step of the escape wheel corresponds to one step of the motor.

3,577,876
WATERTIGHT ALARM WRIST-WATCH
Paolo Spadini, 88, Avenue Leopold-Robert 2300 La Chaux-de-Fonds, Neuchatal, Switzerland
Filed June 12, 1969, Ser. No. 832,736
Claims priority, application Switzerland, June 17, 1968, 8971/68
Int. Cl. G04c *21/34*
U.S. Cl. 58—57.5 **6 Claims**



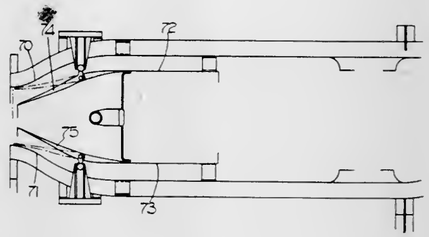
The sounds of the alarm are produced by a membrane exposed to the atmosphere and against which strikes a vibrating blade located in a recess provided in the outer surface of a piece which constitutes a section of an envelope tightly surrounding the watch movement, the latter being located in a recess provided in the inner surface of said piece.

3,577,877
FUEL CONTROL SYSTEMS FOR DUAL FUEL GAS TURBINE ENGINES
Eugene Harold Warne, Solihull, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Mar. 3, 1969, Ser. No. 803,650
Int. Cl. F02c *9/08;* **F02d** *33/00;* **F02c** *3/20*
U.S. Cl. 60—39.28 **15 Claims**



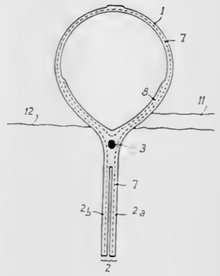
The invention relates to a system for regulating the flow of two fuels to an engine adapted to run on either, regulation being achieved by two coupled valve members, each of which controls the flow of one fuel and which are moved axially by a servosystem powered by one of the fuels. The coupled valve members are rotatable about a common axis to vary the proportion of either fuel supplied to the engine. The configuration of the valve members is such that the total amount of fuel supplied to the engine remains substantially constant, in terms of the requirements of the engine. The servomechanism includes one or more control elements which are operated by signals obtained from the engine itself and/or from apparatus driven by the engine.

3,577,878
FLAME TUBES FOR GAS TURBINE ENGINES
Kenneth Greenwood, Burnley; Alban Heaton, Gt. Harwood, nr. Blackburn; Alwin Harrison, and Squire Ronald Jackson, Burnley, England, assignors to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Dec. 11, 1968, Ser. No. 783,009
Int. Cl. F02c *9/14*
U.S. Cl. 60—39.65 **5 Claims**



A flame tube for a gas turbine engine includes a plurality of primary combustion air inlets, a plurality of secondary combustion air inlets and a plurality of dilution air inlets and variable flow restricting means associated with at least some of the inlets for varying the ratio of primary combustion air to secondary combustion air to dilution air.

3,577,879
FLOATING BARRIER MEANS
Roger Eugene Ducrocq, Colombes, France, assignor to Pneumatiques, Caoutchouc Manufacture Et Plastiques Kleber-Colombes, Colombes, France
Filed July 10, 1969, Ser. No. 840,724
Claims priority, application France, July 10, 1968, Dec. 31, 1968, 158914;182534
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 **6 Claims**

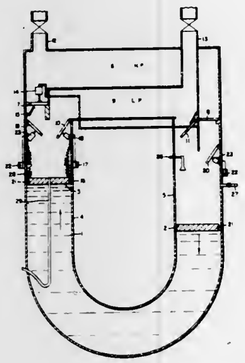


This invention relates to barrier elements used, for example, for restraining oil slicks and the like on the surface of the sea. In such a barrier that comprises an inflatable tube and a skirt connected thereto, the invention provides that the skirt consists of two flexible members each of which constitutes an elementary skirt: means are provided to connect together these elementary skirts by their upper portions and the lower portions of the skirts are split vertically, the splits being uniformly spaced apart and the splits in one elementary skirt being offset relatively to those in the other: at least one flexible mechanical reinforcing element is located in the upper portion of the skirt and this flexible reinforcing element may be located in a channel.

3,577,880
MEANS FOR VARYING THE PHYSICAL CONDITIONS OF A GAS

George W. D. Leslie, Johannesburg, Republic of South Africa, assignor to Anglo American Corporation of South Africa Limited, Johannesburg Transvaal Province, Republic of South Africa

Filed Jan. 24, 1969, Ser. No. 793,673
Claims priority, application Republic of South Africa, Feb. 2, 1968, 67/6058
Int. Cl. F25b *9/00*
U.S. Cl. 62—86 14 Claims

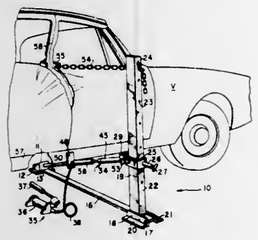


In compression and expansion compartments embodying liquid pistons reciprocating in unison but in opposite directions gas is subjected to compression in one compartment followed by expansion in the other or vice versa and subjected to a heat exchange operation during its passage between the inlet of one compartment and the outlet of the other.

3,577,881
PORTABLE HIGHWAY CRASH RESCUE UNIT

Eugene J. Markovics, 1710 Federal St., McKeesport, Pa. 15132

Filed July 25, 1969, Ser. No. 844,908
Int. Cl. B21d *1/12*
U.S. Cl. 72—302 13 Claims

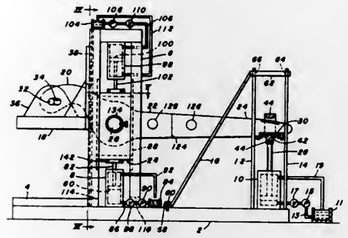


A portable rescue unit to aid in the extraction of accident victims from wrecked vehicles including a base leg, a vertical actuating arm pivotally mounted to the base and an elongated power unit extending from the base to the side of the actuating arm and including a support abutment adapted to engage the vehicle frame. Extension of the power unit pivots the actuating arm which is connected to the vehicle door or other damaged part by a cable or chain having either a hook or a door piercing spike on the end thereof.

3,577,882
HYDRAULIC FORGING PRESS

Daniel L. Lombard, Youngstown, Ohio, assignor to Lombard Corporation, Youngstown, Ohio

Filed Sept. 14, 1967, Ser. No. 667,760
Int. Cl. B21j *9/02*
U.S. Cl. 72—450 7 Claims

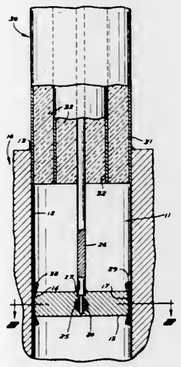


This patent discloses novel forgoing presses of large capacity in relation to the weight of the press. According to the invention, such presses are made by applying force, preferably hydraulically, to a long lever arm and causing a shorter lever arm to apply an accordingly multiplied force to the work. With presses of the invention, total press capacities as large as any hitherto ever designed or contemplated may be obtained. In accordance with a preferred embodiment, there is obtained a relatively unmassive and inexpensive ultra high capacity press having a working surface open on three sides.

3,577,883
CAPACITIVE STRAIN SENSOR

Frank D. Werner, Bloomington, Mich., assignor to Rosemount Engineering Company, Minneapolis, Minn.

Division of Ser. No. 669,036, Sept. 20, 1967, Pat. No. 3,471,758, filed June 26, 1969, Ser. No. 836,867
Int. Cl. G01b *7/16*; G01n *3/00*
U.S. Cl. 73—88.5 3 Claims

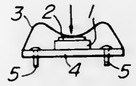


A method of measuring strain wherein a metal rod is mounted transversely within a cylindrical test hole in a metal structure. A spaced relation is maintained between the rod ends and hole surface and changes in electrical capacitance between the rod and the structure are indicative of strains in the test structure.

3,577,884
PRESSURE-MEASURING DEVICE

Takashi Fujita, Toyonaka-shi, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 31, 1968, Ser. No. 749,045
Int. Cl. G01l *1/20*
U.S. Cl. 73—141A 2 Claims



A pressure-measuring device employing a semiconductor element whose electric resistance is variable depending on a strain developed due to impartation of a pressure thereto so that a variation in the electric resistance of the semiconductor element due to an externally applied pressure can be detected by a meter thereby to measure the amount of pressure from the reading of the meter.

3,577,885
PAPER COATING COMPOSITION

Johnny L. Wells, Bartlesville, Okla., assignor to Phillips Petroleum Company

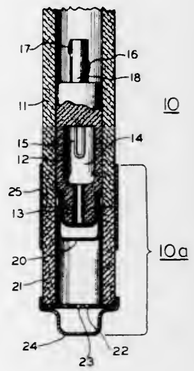
Filed July 30, 1969, Ser. No. 846,285
Int. Cl. G01n *19/04, 21/52*
U.S. Cl. 73—150 8 Claims

A method for detecting coating transfer from a coated film which involves incorporating a fluorescent, ultraviolet light-detachable material in the coating, applying the coating to one surface of the film and subsequently scanning a surface of the film to detect the presence of the fluorescent material.

3,577,886
DEVICE FOR IMMERSION IN MOLTEN MATERIAL TO SAMPLE AND/OR MEASURE TEMPERATURE

John R. Wiese, Dresher, Pa., assignor to Leeds & Northrup Company, Philadelphia, Pa.

Filed Oct. 13, 1969, Ser. No. 865,876
Int. Cl. G01n *1/12*
U.S. Cl. 73—425.4 2 Claims

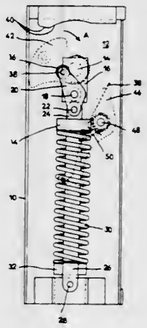


A device for immersion in molten material for obtaining a sample and/or measuring the temperature. For obtaining a sample the device is comprised of a body structure including a cavity for reception of a sample of molten material. An entrance to the cavity may be closed by a fusible cap. The body structure is supported at the immersion end of a protective cardboard tube. A handle extending into the cardboard tube is employed to immerse the body structure in a bath of molten material. The device may or may not include one or more heat sensing devices for measuring the temperature of a sample as it cools and/or for measuring the temperature of the bath of molten material from which a sample may be taken. The device of this invention is characterized by the inclusion of a heat shielding protective enclosure surrounding the immersion end. The enclosure is automatically separable from the device upon immersion in a bath of molten material and moves away from its shielding position.

3,577,887
ENERGY STORAGE CONTROL DEVICE, IN PARTICULAR FOR ELECTRIC CIRCUIT BREAKERS

Guy Lambert, St. Egreve, and Marcel Macaire, Grenoble, France, assignors to Merlin Gerin, Societe Anonyme, Grenoble, France

Filed Nov. 25, 1969, Ser. No. 879,762
Claims priority, application France, Dec. 20, 1968, 179775
Int. Cl. G05g *17/00*
U.S. Cl. 74—2 9 Claims

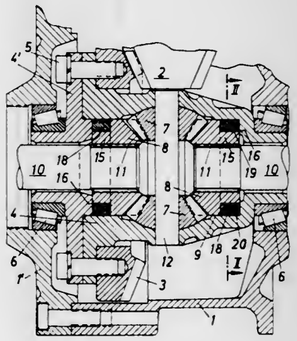


A stored energy closing mechanism for a circuit interrupter comprising a toggle linkage cooperating with stationary guide means so as to allow the scheduling of the torque exerted by the closing spring on the charging device and on the driven parts of the circuit interrupter during the operation of the mechanism.

3,577,888
SELF-LOCKING DIFFERENTIAL GEAR, ESPECIALLY FOR MOTOR VEHICLES

Rudolf Awarth, Munich, Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Munich, Germany

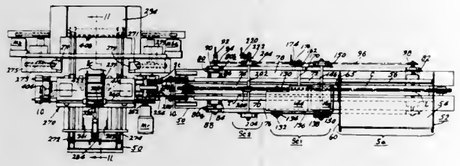
Filed Mar. 12, 1969, Ser. No. 806,457
Int. Cl. F16h *1/44*
U.S. Cl. 74—711 7 Claims



A self-locking differential gear especially for motor vehicles in which differential gears rotatably arranged in a dif-

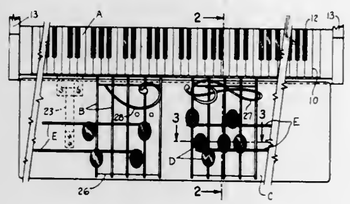
ferential gear housing mesh with gears nonrotatably connected with the axle shafts; clamping bodies are provided between the differential gear housing and at least one axle shaft within annular spaces; the clamping bodies are in operative connection with hollow cylindrical friction surfaces coordinated to the differential gear housing and with support surfaces coordinated to the axle shaft whereby the clamping bodies are constructed as sections of a ring with outer surfaces matched to the friction surfaces and with internal inclined surfaces that are different from a coaxial cylinder.

3,577,889
METHOD AND APPARATUS FOR SLITTING AND TRIMMING PIPE COVERING
Herluf N. Eriksen, Burlington, N.J., assignor to Keene Corporation, Trenton, N.J.
Filed June 18, 1969, Ser. No. 834,262
Int. Cl. B26d *3/08;* **B23d** *21/04*
U.S. Cl. 83—7 **9 Claims**



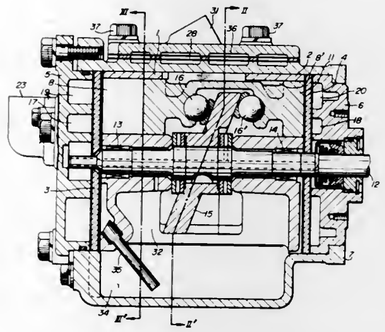
An apparatus for finishing tubular members, conveyor means for moving tubular members in spaced-apart relation along a predetermined path, and along said path a first cutting station including a first saw blade for cutting one wall of the tubular member for its entire length, a second cutting station including a second cutting blade for partially slitting the inner wall of said tubular member along a line diametrically opposed to said first cut to provide a hinge, and a trimming station including a pair of spaced cutting elements to trim opposite axial ends of the tubular members upon relative movement of the tubular member and cutting elements.

3,577,890
MUSICAL TEACHING AID
Edgar F. Walker, and Montez A. Walker, Greenville, S.C.
Filed Apr. 27, 1970, Ser. No. 32,216
Int. Cl. G09b *15/02*
U.S. Cl. 84—472 **4 Claims**



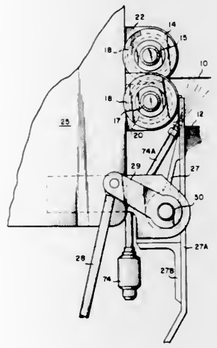
An apparatus for teaching the relationship between musical notes on a staff and the keyboard of a piano. The apparatus includes five spaced parallel elongated rods which are supported so that one end of the rods and the spaces therebetween terminate in corresponding keys on a keyboard. A display element having an elliptically shaped main body and a shank portion positioned on said rods. A transverse bore extends through the main body perpendicular to an elongated slot for accommodating the shank portion so that more than one main body portion can be positioned on the shank in order to represent the interval between notes.

3,577,891
SWASH PLATE COMPRESSOR
Mamoru Nemoto, Katsuta-shi, and Seijiro Tani, Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Aug. 20, 1969, Ser. No. 851,687
Claims priority, application Japan, Aug. 21, 1968, 43-59171;43-71485
Int. Cl. F01b *1/00*
U.S. Cl. 92—72 **2 Claims**



Two cylinder blocks of a swash plate compressor are so shaped as to form a chamber between the cylinder block assembly, a shell and a head cover of the compressor near the junction of said two cylinder blocks. The chamber thus formed is communicated with the discharge ends of respective cylinder bores through high pressure passageways having a cross-sectional area smaller than that of said chamber. A pipe having a large number of apertures perforated through the wall thereof is disposed at that end of the high pressure passageway which is open in said chamber.

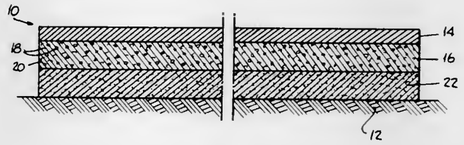
3,577,892
SPRAYING DEVICE AND METHOD
Clark A. Moore, Stockbridge, Mass., assignor to The Clark-Aiken Company, Lee, Mass.
Filed Mar. 7, 1969, Ser. No. 805,290
Int. Cl. B65h *33/00*
U.S. Cl. 93—93 **5 Claims**



The subject invention is an apparatus and method for spraying material on a selected sheet of paper as counted sheets of paper are being moved to a piling secton. One or more spraying nozzles are positioned near the piling section to spray a parting agent on one side of selected sheets of paper so that an increment of paper piled on a treated sheet can be readily separated from the rest of the pile. The nozzle

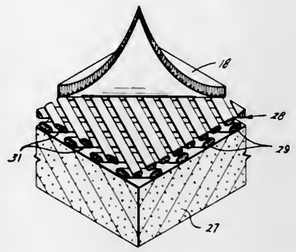
is activated to spray responsive to a signal received from a counter which impulses the signal after a preselected number of sheets have been counted to form an increment.

3,577,893
INSULATION METHOD AND CONSTRUCTIONS
Robert L. Towner, Pittsburgh, Pa., assignor to William B. Davison, Pittsburgh, Pa.
Filed Sept. 27, 1968, Ser. No. 763,192
Int. Cl. E01c *9/00*
U.S. Cl. 94—4 **12 Claims**



Pavement procedures and constructions for materially reducing frost heave in pavements and the like; during construction of the pavement or like structure, an insulating layer consisting essentially of particulate thermal insulating material dispersed throughout a matrix of soil cement is applied to define a frost barrier which insulates the subgrade.

3,577,894
PLAYING COURT
Dean Emerson, Jr., 33 Saddlebrook, Houston, Tex., and Sidney B. Wood, Jr., 430 E. 56th St., New York, N.Y.
Filed Jan. 28, 1969, Ser. No. 794,641
Int. Cl. E01c *7/00*
U.S. Cl. 94—7 **6 Claims**

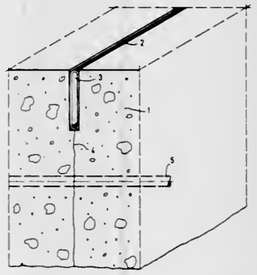


This patent discloses a playing court which resembles turf in feel and in which the upper surface of the court dries extremely rapidly to permit the court to be used immediately after a rain.

3,577,895
SLIDE CONSTRUCTION
Eunice A. Carlin, 5301 Hollywood Road, Edina, Minn. 55436
Filed Feb. 10, 1969, Ser. No. 797,969
Int. Cl. E01c *7/00*
U.S. Cl. 94—7 **8 Claims**

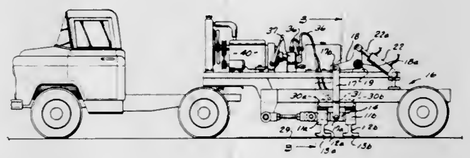
An elongated strip of relatively flexible material having a plurality of spaced apart generally longitudinally extending relatively narrow ridges on the upper surface thereof and adapted to be secured to a hillside for receiving toboggans and the like in sliding engagement thereon.

3,577,896
METHOD FOR PRODUCING STRUCTURE COMPONENTS OF REINFORCED CONCRETE SUBJECTED TO TENSILE STRESS
Ulrich Finsterwalder, Munich-Obermenz, and Klemens Finsterwalder, Socking near Starnberg, Germany, assignors to Dyckerhoff & Widmann Kommanditgesellschaft, Munich, Germany
Filed Oct. 17, 1968, Ser. No. 769,478
Claims priority, application Germany, Oct. 17, 1967, P 16 58 451.3
Int. Cl. E01c *7/10*
U.S. Cl. 94—24 **5 Claims**



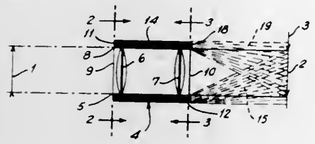
Method for making reinforced concrete structures or elements to be subjected to tensile stresses where pressure pads or casing presses are located in slots extending down from the surface at a predetermined distance from one another in parallel planes and splitting pressure is applied by hydraulic means through the presses in a direction perpendicular to the parallel planes.

3,577,897
SONIC METHOD AND APPARATUS FOR LAYING AND REPAIRING ASPHALT MATERIAL
Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif.
Filed Nov. 12, 1968, Ser. No. 774,983
Int. Cl. E01c *19/30*
U.S. Cl. 94—48 **3 Claims**



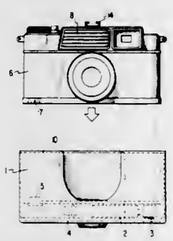
Sonic energy is generated by means of a self-contained resonant vibration system which utilizes an orbiting-mass oscillator as the sonic generator. The sonic energy is coupled from the resonant vibration system to a mixture of asphaltic material and gravel on a roadway structure or the like, this roadway material being excited as a resistive load. The resonant vibrational energy thus imparted to the roadway material causes random vibrations of the particles thereof which results in both a uniform mixing and a heating of the materials, as well as liquid migration therein, to provide a uniform asphalt concrete end structure.

3,577,898
SUPPLEMENTAL ILLUMINATING OF FILM PLANE IN PHOTOGRAPHIC CAMERAS
Herbert E. Bragg, New York, N.Y., assignor to Twentieth Century-Fox Film Corporation, New York, N.Y.
Filed Apr. 24, 1967, Ser. No. 633,250
Int. Cl. G03b *27/76*
U.S. Cl. 95—11 **2 Claims**



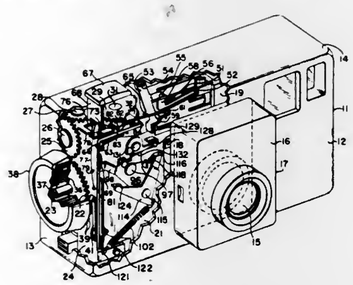
Facilities are provided for introducing additional light supplementing or varying the exposure of a piece of film at the same time that it is being exposed to light from an object forming an image on the film. One way this is done is by admitting light from the same source through passages around the lens mount to the film frame area. This light is admitted through holes drilled through the housing around the lens mount, which holes may be left open or may have small lenses, or color filters, inserted in them. Preferably, however, such holes or bores are filled with bundles of light transmitting fibers. Held close together in the holes, the fibers may be separated on emergence at the inner ends of the holes for maximum distribution of the supplemental light transmitted by them over the exposure area. The supplemental light transmitting devices increase the effective exposure of the film with respect to the radiant energy coming from the object available, without the invention, to produce the image. They also enable special effects to be produced in a variety of ways: for example, the color balance of multilayered color negative films may be altered; the apparent contrast of the developed image may be changed and various other controlled changes may be introduced with respect to the recorded color images. Diaphragm means, such as relatively rotatable overlapping perforated annuli, may also be used to control the supplemental light in various ways. Supplemental light may also be admitted through passages at other positions.

3,577,899
FLASH SYSTEM FOR A PHOTOGRAPHIC CAMERA
Yoshizo Ikegami, Nishinomiya-shi, Japan, assignor to Fuji Shashin Film Kabushiki Kaisha, Kanagawa, Japan
Filed Dec. 26, 1967, Ser. No. 693,384
Claims priority, application Japan, Dec. 24, 1966, 41/8469
Int. Cl. G03b *17/02*
U.S. Cl. 95—11 **2 Claims**



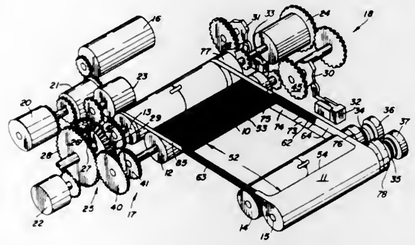
A high-speed photographic flash system for a camera assembly. The camera assembly includes an outer case which is detachably connected to the main body of the camera and carries a portion of the electrical components for the photographic flash system. The flash system includes an electric cell, a trigger coil, a discharge tube and a thin plate-shaped electrolytic condenser. The plate-shaped condenser is carried by and extends along a portion of the outer case wall and is electrically connected to the main body of the camera when the outer case is connected thereto.

3,577,900
FILM-METERING AND DOUBLE-EXPOSURE PREVENTION MECHANISM FOR PHOTOGRAPHIC CAMERA
Dean M. Peterson, Littleton, Colo.; Charles E. Pickering, Irondequoit, and Fredric A. Mindler, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed July 15, 1968, Ser. No. 744,784
Int. Cl. G03b *17/42, 19/04, 1/42*
U.S. Cl. 95—31 **5 Claims**



A double-exposure prevention device for a camera having a lockable film advance includes a trigger which is blocked to prevent a second exposure by an element controlled by a spring whose controlling function is adjustable by the mechanism in the camera which locks film advance.

3,577,901
REMOTELY CONTROLLED FOCAL PLANE SHUTTER
Earl E. Gray, Barrington, Ill., assignor to Bourns/Cai, Inc.
Filed Aug. 2, 1968, Ser. No. 749,869
Int. Cl. G03b *9/32*
U.S. Cl. 95—57 **10 Claims**

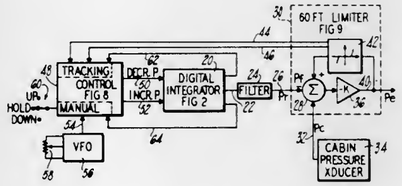


Each one of a pair of focal plane shutter curtains is mounted independently of the other. An exposure slit is formed between the trailing edge of one curtain and a leading edge of the other curtain. A gear train and a dual-action differential arrangement drives the two curtains to move the slit across the format area of a camera. The gear train is, in turn, controlled by electromagnetic clutch, brake, and antibacklash devices which are actuated sequentially to start the shutter curtain travel, to couple the two curtains together to prevent variations in slit width, and to stop the curtain at the end of the travel. By locking one gear and turning another gear in the differential, the slit width may be adjusted by displacing one curtain with respect to the other.

3,577,902
DIGITAL INTEGRATOR
Thomas E. Gardner, Sunnyvale, Calif., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Nov. 14, 1968, Ser. No. 775,673
Int. Cl. B64d *13/04*
U.S. Cl. 98—1.5 **2 Claims**

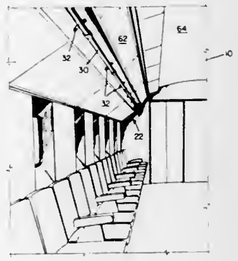
An aircraft cabin air pressure controller includes a digital integrator having a 1023 counter and a counter which is adjustable for counts of 1022, 1023, or 1024. The two counters

are used with a set-reset flip-flop to form a pulsewidth modulator. The digital integrator can cause an increase in the width of the pulsewidth modulated signal by counting to 1024, can cause a decrease in the width of the pulsewidth modulated signal by counting to 1022, or it can hold the width of the signal by counting to 1023, which is the same count as given by the reference counter. The rate of pressure change created by the system is governed by the occurrence of special counts in the variable counter, the counter counting to 1023, many, many times between each command which causes the counter to either count to 1022 or to 1024, under the control of a manually adjustable rate clock. The output of the digital integrator is filtered and passed into a summing network together with an actual cabin pressure signal so as to generate an error signal for controlling the pressurization system. In addition, the error signal is fed into a 60-foot limiter that prevents the error signal from varying from the actual cabin pressure by more than the pressure



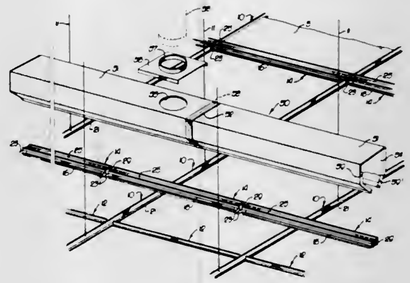
equivalent to 60 feet of altitude at sea level density. Whenever a 60-foot limit is reached, control of the digital integrator is taken over by an automatic tracking circuit which causes the digital integrator to generate a pressure reference signal at a rate of change which is much faster than the maximum permissible manual rate of pressure change. Thus, the 60-foot limit controls the actual pressure error signal by analog means, and additionally provides digital control for automatic tracking of the digital integrator so that it will be brought into correspondence with the pressure command which is integrally forced on the system by the 60-foot limiter. The 60-foot limiter comprises a digital indicating analog clamp having a pair of differentially operable, complementary transistors in the feedback loop such that when the error signal exceeds a given magnitude, an appropriate one of the transistors will conduct, which inserts a small resistor in parallel with a large feedback resistor, and which also provides a digital output signal indicating that the maximum error signal has in fact been exceeded.

3,577,903
HANDRAIL AND AIR-CONDITIONING DUCT SUPPORT
Walter S. Eggert, Jr., Huntingdon Valley, Pa., assignor to The Budd Company, Philadelphia, Pa.
Filed Dec. 30, 1969, Ser. No. 889,196
Int. Cl. B60h *1/24*
U.S. Cl. 98—2 **3 Claims**



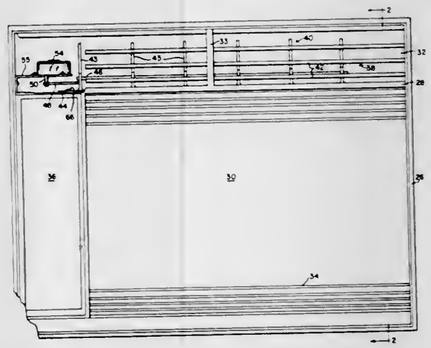
A support member providing support for a vehicle handrail and an air-conditioning duct. The support member passes through the air duct and is designed to minimize air turbulence.

3,577,904
SUSPENDED CEILING INTEGRATED AIR DISTRIBUTION SYSTEM
Robert R. Lambert, 442 W. Leadora Ave., Glendora, Calif. 91740
Filed Apr. 14, 1969, Ser. No. 815,835
Int. Cl. F24f *13/06*
U.S. Cl. 98—40 **6 Claims**



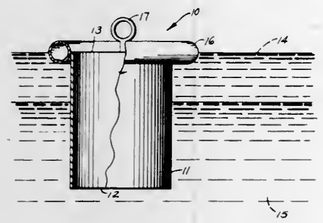
A plurality of air distribution subassemblies, each having spaced sidewalls defining an air distribution passage therebetween, are mounted in a linear array transversely of a plurality of preexisting suspended ceiling main runner members, in one embodiment straddling cross T-bar members spanning the distance between said main runners, wherein a continuous air supply plenum is mounted on two or more adjacent subassemblies of such air distribution subassemblies with a continuous air supply outlet therein along a lower portion thereof and extending across the associated main runner, and in one said embodiment across the intersection of a main runner and across T-bar, to provide an effectively continuous linear air distribution passage through said ceiling across the main support members of the preexisting ceiling grid or support system.

3,577,905
AIR GUIDE STRUCTURE
W. R. Nussdorfer, and James M. Farrel, Greenville, Mich., assignors to White Consolidated Industries, Inc., Greenville, Mich.
Filed May 19, 1969, Ser. No. 825,583
Int. Cl. F06b *7/02*
U.S. Cl. 98—94 **5 Claims**



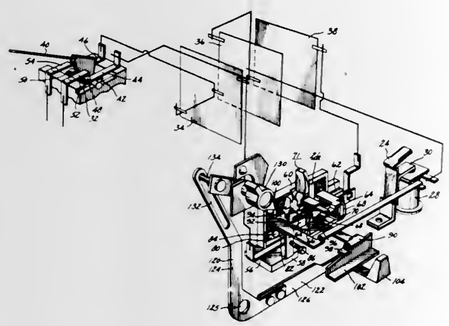
Air guide structure for use in air conditioners comprising a plurality of vanes pivotally mounted on a support base extending across the edge of air outlet opening, drive means for oscillating said vanes to sweep the air transversely from the opening into the room conditioned thereby, the support base being adjustably positionable transversely of the opening to alter the drive connection to the vanes and thereby vary the amount of air directed respectively to the right or left of the front of the air conditioner.

3,577,906
GREASE-CATCHING DEVICE
John K. Preuss, 520 N.W. 144th St., Miami, Fla. 33168
Filed May 21, 1969, Ser. No. 826,562
Int. Cl. A47j *43/28*
U.S. Cl. 99—234R **3 Claims**



A cylindrical object having an open top and bottom and a flotation ring. This device when placed in stock pots containing soups, stews and the like, enables the user to skim the top of the contents of the pot allowing the grease to be easily dipped from the device without losing any of the contents in the pot.

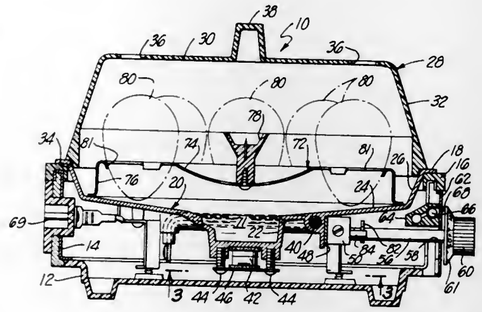
3,577,907
ELECTRIC TOASTER CONTROL
Raymond W. Kunz, Monroe, Conn., assignor to General Electric Company
Filed May 12, 1969, Ser. No. 823,688
Int. Cl. A47j *27/00, 27/62*
U.S. Cl. 99—329 **7 Claims**



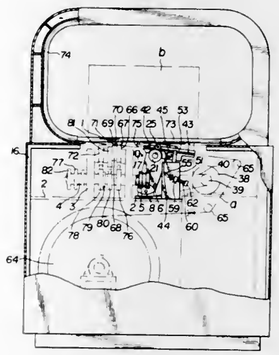
An electric toaster with a timer for controlling the toasting cycle wherein a primary member is provided for setting a toasting time interval, and a secondary member is provided for temporarily changing the toasting time interval without changing the position of the primary setting member.

3,577,908
EGG COOKER
Frederick J. Burg, Bellrose, N.Y., assignor to Salton, Inc., New York, N.Y.
Filed June 2, 1969, Ser. No. 829,324
Int. Cl. A47j *27/62*
U.S. Cl. 99—333 **11 Claims**

An egg cooker is disclosed which utilizes an electrically heated, covered water container. During the operation of the cooker the amount of heat supplied to the container is regulated by an adjustable thermostat operating essentially as an infinite switch. This thermostat regulates the heat supplied so that the cooking time is varied in accordance with the rate at which water is boiled in the container and escapes from the container past the lid as steam. A fixed thermostat is provided to shut off the power to the heating element used when all water has been evaporated.

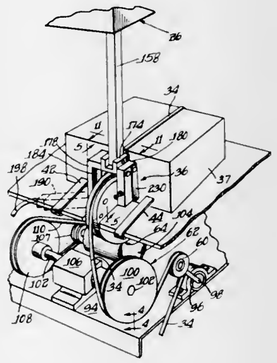


3,577,909
AUTOMATIC STRAPPING MACHINE
Masatoshi Takano, No. 377 Higashi Narashino-machi 1-chome, Chiba-ken, Narashino-shi; Hiroshi Arita, No. 135 Otake, Sanbu-gun, Chiba-ken, Oami-Machi, and Hayao Omori, No. 13, 11-go. Oshima-machi, Ko-to-ku, Tokyo-To, Japan
Filed Nov. 12, 1968, Ser. No. 774,711
Claims priority, application Japan, Dec. 29, 1967, 42/84512
Int. Cl. B65B *13/04*
U.S. Cl. 100—4 **3 Claims**



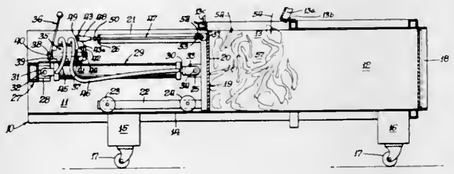
In an automatic strapping machine in which a strapping band is advanced in one direction in a guide to encircle an article and is then advanced in the opposite direction to engage the article, apparatus for increasing the tension in the band before the ends of the band are fastened together. The apparatus comprises a frame mounted for displacement in both directions along the path of movement of the band, feed rolls carried by the frame to engage the band in the path, drive means for rotating the feed rolls to advance the band first in the one direction and then in the opposite direction, and control means for operating the feed rolls and the frame. The control means causes the band to advance around the article in the first direction until the article is surrounded by the band, then clamps the leading end of the band upon encirclement of the article and interruption of the first means, then drives the feed rolls in the opposite direction and to cause the frame to be displaced along the path toward the article which arrests the feed rolls, and finally operates to forcibly displace the frame away from the article to apply additional tension to tighten the band around the article.

3,577,910
PLASTIC STRAPPING MACHINE
John G. Feldkamp, 481 Hamilton Road, Homewood, Ill.
Filed Apr. 16, 1969, Ser. No. 816,737
Int. Cl. B65b *13/24*
U.S. Cl. 100—17 **11 Claims**



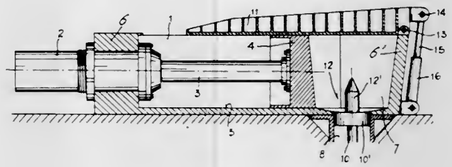
Apparatus for applying plastic strapping comprises a base which defines a work platform and a joint-forming station. A complementary strap supply includes a source of strapping and a strap-feeding arrangement mounted in the base for controllably advancing strapping material toward the joint-forming station. Cooperative joint-forming heads are mounted for converging movement toward the work station, one of the heads including a strap-gripping arrangement and the other head including guide means for controllably feeding the strapping material. In addition, joint-forming means are provided and include a transfer member mounted in the base and an outlet member mounted in one of the heads to cooperate in forming joints in the strapping.

3,577,911
CONTROL FOR THE OPERATION OF THE RAM OF A BALER
Stanley A. Morse, Hammond, Ind., assignor to American Hoist and Derrick Company, St. Paul, Minn.
Filed Apr. 14, 1969, Ser. No. 815,752
Int. Cl. B30b *15/00*
U.S. Cl. 100—53 **2 Claims**



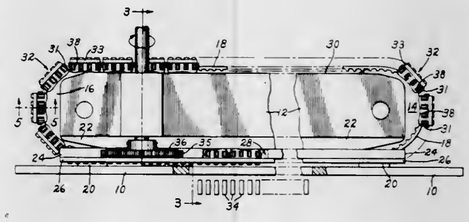
A control mechanism for balers providing for the full cycling of a baler ram through a compression stroke, through a retraction stroke, and to a stop, upon a single initial manual actuation of a hand control on the control mechanism.

3,577,912
HORIZONTAL SCRAP METAL PRESS
Giovanni Busi, Piazzale Kossut, Brescia, Italy
Filed Oct. 1, 1968, Ser. No. 764,167
Claims priority, application Italy, Oct. 3, 1967, 814,006
Int. Cl. B30b *15/32*
U.S. Cl. 100—218 **4 Claims**



A horizontal press is provided for forming compressed scrap metal briquettes that can be charged to electric furnace crucibles. Scrap metal is introduced into an elongated casing having a conical shape and a concave bottom. The scrap metal is compressed through the action of a fluid actuated cylinder and piston assembly.

3,577,913
TYPE CARRIER DEVICE
Herbert J. Hinze, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Filed July 24, 1969, Ser. No. 844,453
Int. Cl. B41j *1/20*
U.S. Cl. 101—93 **6 Claims**

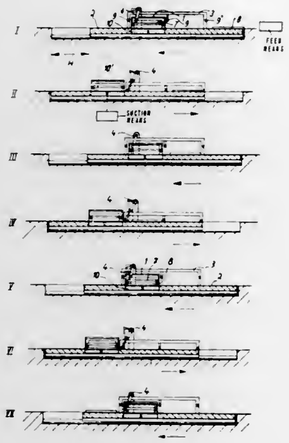


The disclosure embodies a printing mechanism having a number of separatable type carrying blocks successively arranged for travel along an endless path. Along a linear portion of the endless path between a pair of spaced-apart sprockets is a printing station where the blocks are guided. The blocks are separatable in the sense that they are not physically joined by connectors. Instead they are pushed along their path of travel by a gear which meshes with the blocks. An endless belt connects the sprockets and passes through the blocks. Coupling means on the blocks couple with the belt to provide its drive between the sprockets, the belt in turn dragging the blocks around the sprockets.

3,577,914
SCREEN PRINTING MACHINE EMPLOYING A RECIPROCATING PRINTING AND FEED PLATE
Heinrich Ronge, 115 Bergerhide, Wuppertal-E, Germany
Continuation-in-part of application Ser. No. 723,678, Apr. 24, 1968, now abandoned. This application Nov. 28, 1969, Ser. No. 880,791
Int. Cl. B41l *27/06*
U.S. Cl. 101—124 **10 Claims**

A screen printing machine has a reciprocating printing and feed plate and retractable stops combined and cooperating with said plate so that the material to be printed moves forward over the plate in a stepwise manner. The screen is

mounted over this plate and reciprocates with it so that the material passes under the screen. While it is under the screen

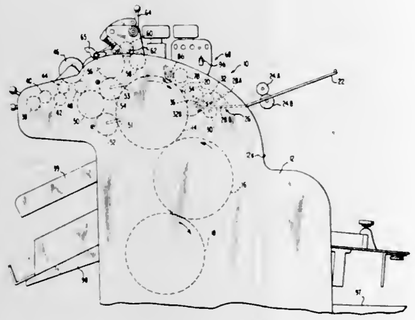


a relatively stationary printing squeegee is lowered into its operative position and printing is thereby effected.

3,577,915
HOT SCREEN PRINTING WITH THERMOPLASTIC INK
Stanley P. Thompson, and Don L. Shofer, Bartlesville, Okla., assignors to Phillips Petroleum Company
Division of Ser. No. 602,551, Dec. 19, 1966, filed May 1, 1969, Ser. No. 821,081
Int. Cl. B41m *1/12*
U.S. Cl. 101—129 **5 Claims**

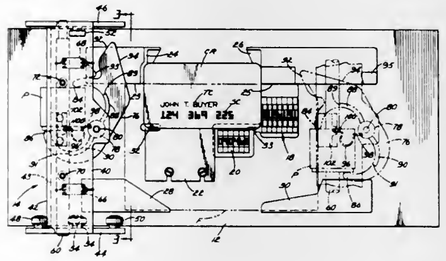
A hot screen printing process is disclosed wherein a thermoplastic ink comprising polyethylene, a colorant, and either an ester of rosin or a wax is used at a temperature in the range from about 200—450° F. for screen printing on polyolefin.

3,577,916
DUPLICATOR PROGRAM CONTROL ASSEMBLY
Kenneth J. Tonkin, Glenview, and John P. Gallagher, Park Ridge, Ill., assignors to A. B. Dick Company, Niles, Ill.
Division of Ser. No. 633,866, Apr. 26, 1967, filed Apr. 8, 1969, Ser. No. 836,183
Int. Cl. B41l *25/02*
U.S. Cl. 101—148 **2 Claims**



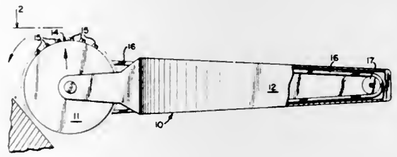
An etcher assembly for etching a master cylinder of a duplicating machine supported between the side plates of the duplicating machine. The etcher assembly includes a rotatably mounted metering roller that is partially disposed within a fountain mounted on the duplicating machine, and an etch applicator roller rotatably supported between two parallel support arms that are adapted to swing about the shaft of the metering roller. A pair of return springs constantly urge the etch applicator roller into contact with the metering roller.

3,577,917
PRINTING MACHINES WITH SHIFTING ROLLER PLATEN
Jack G. Nantz, Euclid, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed Aug. 4, 1969, Ser. No. 847,178
Int. Cl. B41f *3/04*
U.S. Cl. 101—269 **7 Claims**



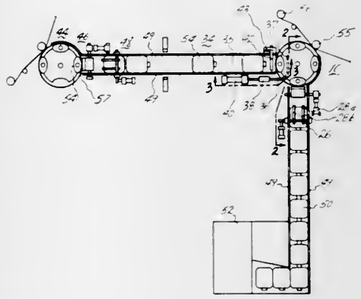
Imprinting of forms with fixed and variable data from printing elements comprising two distinct groups of characters. A bed retains the printing elements and the form, and a roller platen moves from a home position in a first path across the form to an actuated position and back to home position in a second path across the form to perform a printing cycle. The roller platen is shiftable between the first and the second path such that as the platen is moved in the first path it is operative to imprint a single line only of one group of characters, and as it is moved in the opposite direction in the second path it is operative to imprint a single line only of the other group of characters, to thereby compensate for imprinting pressure as a result of rolling line contact of the platen with only a single line of characters without the platen reaching any adjacent line of characters.

3,577,918
MARKING-MEASURING DEVICES
David John Wayfield, (Freeland, Md.), Box 188, Tivoli, N.Y.
Continuation-in-part of application Ser. No. 500,866, Oct. 22, 1965, now abandoned. This application Oct. 3, 1967, Ser. No. 672,506
Int. Cl. B41k *1/22*
U.S. Cl. 101—328 **26 Claims**



A portable, hand-operated tool which includes a printing pressure roller for marking a surface in precise linear segments, each of the segments being of a length greater than the circumference of the printing pressure roller.

3,577,919
METHOD AND APPARATUS FOR POSITIONING ARTICLES
Alexander J. Usko, Wapping, Conn., assignor to Mensanto Company, St. Louis, Mo.
Filed Mar. 13, 1969, Ser. No. 807,013
Int. Cl. B23q *5/22;* **B65g** *47/24*
U.S. Cl. 101—426 **13 Claims**



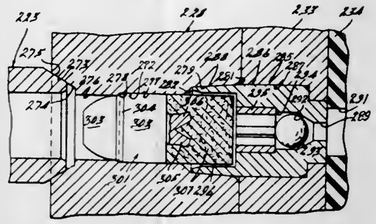
A method of handling elongated articles such as plastic bottles being transported to and from a vertically oriented work station, which involves transporting the articles on their sides, pivoting each article upright at the work station and striking each article in a controlled manner on leaving the work station to return it to its side. Apparatus includes a pivotally mounted loading device, a reciprocally mounted arm at the discharge of the work station for knocking the bottom of each article onto a conveyor and a bumper adjacent the arm to prevent the upper article portion from moving in the same direction as the arm when the article is contacted thereby.

3,577,920
METALLIC LITHOGRAPHIC PLATE AND METHOD OF MAKING THE SAME
Melvyn London, Deerfield; Guy Robert Smetters, Downers Grove, and George Eugene Beck, Prospect Heights, Ill., assignors to London Litho-Aluminum Company, Incorporated, Lincolnwood, Ill.
Filed July 10, 1967, Ser. No. 651,986
Int. Cl. B41n *1/08;* **B23k** *21/00*
U.S. Cl. 101—459 **3 Claims**

Metallic lithographic plate for use in the copperized lithographic printing process, comprising a base layer of magnesium-aluminum alloy and a surface layer sheet of aluminum metallurgically bonded thereto under conditions of temperature and pressure which bring about both physical and chemical changes in said surface layer and place it in a hard tempered condition, the resulting "activated" aluminum surface improving the ease of depositing copper thereon and the durability and tenacity of the copper so deposited in image areas subsequent to development, and also preventing the decomposition of light sensitive diazo compounds in contact with said surface layer.

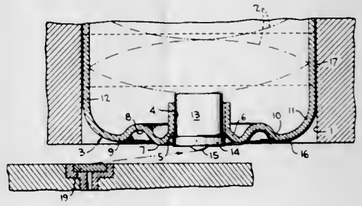
3,577,921
CASELESS AMMUNITION FOR FIREARMS AND THE LIKE
Jules Edmond Van Langenhoven, Benton County, Ark., assignor to Victor Comptometer Corporation, Chicago, Ill.
Division of Ser. No. 473,556, July 7, 1965, abandoned, filed July 18, 1968, Ser. No. 760,108
No. 760,108
Int. Cl. F42b *9/16*
U.S. Cl. 102—38 **10 Claims**

There is herein disclosed caseless ammunition for firearms comprising a projectile portion and an associated caseless



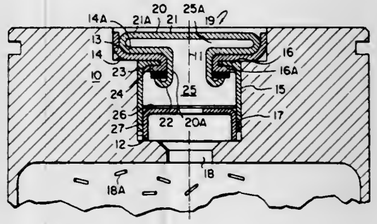
one-piece solid porous ungranulated propellant portion.

3,577,922
COMBUSTIBLE SHELL BASE
Paul Zehfeld, Hutlenstrasse 82, Dusseldorf, and Hans-Dieter Harnau, Feldstrasse 2, Gevelsberg, Germany
Continuation-in-part of application Ser. No. 594,565, Nov. 15, 1966. This application Feb. 6, 1969, Ser. No. 796,956
Claims priority, applications Germany, Nov. 17, 1965, May 14, 1966, P 12 91 262.8-15, P 15 78 204.4
Int. Cl. F42b *9/28*
U.S. Cl. 102—44 **4 Claims**



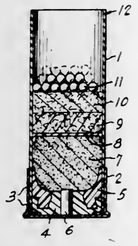
A combustible cartridge with an electric primer in which the bottom portion of the cartridge composed of combustible synthetic material with a plurality of annular surfaces arranged in different planes relative to one another and a primer is provided in the bottom portion.

3,577,923
PERCUSSION-ELECTRIC PRIMER AND RADIATION SHIELD
William E. Perkins, Runnenede, N.J., and Allen F. Schlack, Churchville, Pa., assignors to the United States of America as represented by the Secretary of the Army
Filed Jan. 16, 1969, Ser. No. 791,598
Int. Cl. F42b *9/08*
U.S. Cl. 102—46 **6 Claims**



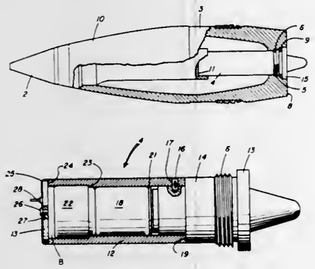
A combined percussion-electric primer having an electrically insulated rimfire cap is centrally positioned at the rearward end of a cartridge, and an electromagnetic radiation shield having a weakened central portion adapted to yield upon firing pin impact is positioned rearwardly of the primer.

3,577,924
SHOTSHELLS
Donald Urquhart Findlay; Francis Hamnet Garland McCaffrey, Brownsburg, Quebec, and George David Taylor, Lachute, Quebec, Canada, assignors to Canadian Industries Limited, Montreal, Quebec, Calif.
Filed Feb. 14, 1969, Ser. No. 799,276
Claims priority, application Canada, Mar. 26, 1968, 015936
Int. Cl. F42b *7/08, 9/26*
U.S. Cl. 102—42R **4 Claims**



The present invention provides a novel shotshell basewad construction by which the useful life of reloadable shotshells may be increased. The basewad comprises two interlocking components of molded thermoplastic material which are pressed into the bottom end of a shotshell tube. The basewad construction provides increased durability and improved gas sealing properties over earlier known types.

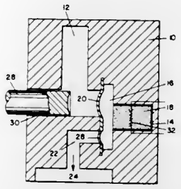
3,577,925
HOUSING FOR BALLISTIC TELEMETERING SONDE
Louis A. Schmidt, Hyattsville, Md.
Filed Nov. 26, 1965, Ser. No. 510,453
Int. Cl. F42b *11/00;* **H05k** *13/04, 13/00*
U.S. Cl. 102—70.2 **4 Claims**



An improved housing for standardizing the assembly, packaging and potting of various combinations of operational components for a radio sonde into a highly flexible and interchangeable unit.

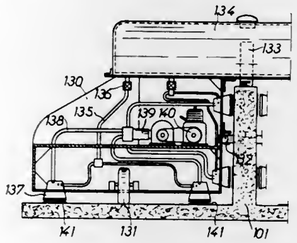
3,577,926
VARIABLE VOLUME SAFE AND ARM MECHANISM
Wilfred C. Schuemann, Rawlings, Md., assignor to Hercules, Incorporated, Wilmington, Del.
Filed Dec. 31, 1968, Ser. No. 789,058
Int. Cl. F42c *15/32, 15/04, 15/06*
U.S. Cl. 102—76 **7 Claims**

A safe and arm mechanism is provided employing in combination a pressure-responsive diaphragm and a variable volume chamber which are adaptable to change the mechanism from the "safe" configuration to the "armed" configuration. In the "safe" configuration gas pressure resulting from accidental ignition of a squib is insufficient to rupture the pressure-responsive diaphragm protecting the device in which the safe and arm mechanism is employed. In the "armed" configuration the available volume of the variable volume chamber is reduced and ignition of a squib within the



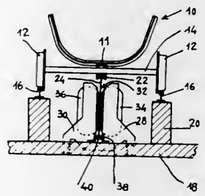
mechanism ruptures the pressure-responsive diaphragm allowing the squib gases to initiate an igniter.

3,577,927
ARRANGEMENT FOR CONFINING A VOLUME OF FLUID
Jean Henri Bertin, Neuilly-sur-Seine, France, assignor to Bertin & Cie, Plaisir, France
Filed Apr. 4, 1968, Ser. No. 718,764
Claims priority, application France, Apr. 5, 1967, Aug. 20, 1967, 101,643;119,166
Int. Cl. B60v *1/04, 1/16*
U.S. Cl. 104—23 **10 Claims**



An arrangement for reducing leaks in machines, chiefly, ground-effect machines such as vehicles running over or under a fluid cushion, this being obtained by providing a friction reduced to a minimum between the free edges of walls which peripherally confine the fluid cushion and the cooperating vertical or horizontal track surfaces as provided by laying a trail of lubricant in the gap between said free edges and the track surface, preferably through distributing channels extending inside the walls and opening into registry with said gap.

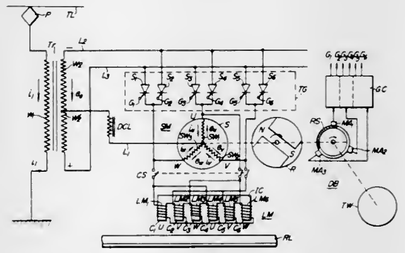
3,577,928
LINEAR INDUCTION MOTOR DRIVE SYSTEM
Marcel Victorri, Grenoble, France, assignor to Merlin Gerin, Societe Anonyme, Grenoble, France
Filed Apr. 18, 1969, Ser. No. 817,488
Claims priority, application France, May 6, 1968, 150757
Int. Cl. B61b *13/00*
U.S. Cl. 104—148LM **5 Claims**



A linear induction motor drive system comprising a stationary magnetic stator structure 28,30 having an airgap 32 in which a magnetic traveling field drives the armature plates

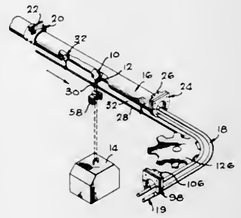
24 secured to the driven vehicles 10. The armature plates are pivotally connected at 22 to the vehicles in order to allow rolling movements of the vehicles and overlapping of the armature plates in vertical inflexion zones.

3,577,929
ELECTRIC VEHICLE DRIVING AND CONTROLLING APPARATUS
Yoshimitsu Onoda, and Hisakatsu Kiwaki, Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Oct. 7, 1968, Ser. No. 774,052
Claims priority, application Japan, Nov. 10, 1967, 42/71991
Int. Cl. B60l *13/00*
U.S. Cl. 104—148 **8 Claims**



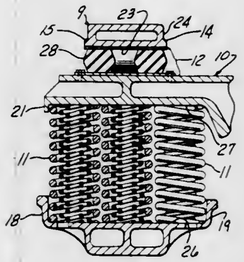
An electric vehicle driving and controlling apparatus, wherein during the low-speed operation, single-phase AC power is supplied to a synchronous motor type rotary machine through a thyristor group to thereby control the rotation of said rotary machine, and during the ultra-high-speed operation, three-phase AC power available at the armature terminals of said rotary machine is also applied to a linear motor to thereby accelerate the latter.

3,577,930
MONORAIL SYSTEM
Jack Rooklyn, Northridge, Calif., assignor to Republic Corporation, Beverly Hills, Calif.
Filed Nov. 24, 1967, Ser. No. 685,561
Int. Cl. B61b *31/00;* **B65g** *17/24;* **E01b** *25/22*
U.S. Cl. 104—173 **9 Claims**



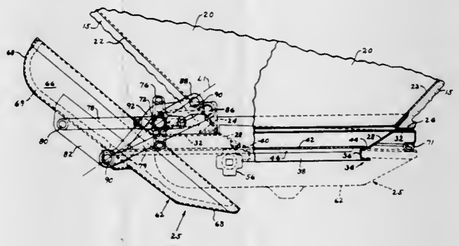
An overhead conveyor system having a trolley rolling along a pair of spaced bars and a pendant for carrying goods, the pendant suspended from the trolley and passing downwardly between the rods. The trolley comprises a pair of hemispheres, one hemisphere rolling along each rod, and the hemispheres are pivotally connected to rotate independently of each other.

3,577,931
DAMPENED RAILWAY CAR TRUCK
James A. Shafer, East Cleveland, Ohio, assignor to Midland-Ross Corporation
Filed Dec. 9, 1966, Ser. No. 600,486
Int. Cl. B61f *5/06, 5/08, 5/12*
U.S. Cl. 105—197 **3 Claims**



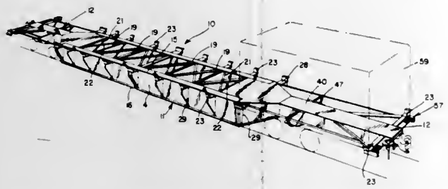
A railway car truck which includes a bolster supported at each end on load springs which are in turn supported by the side frames of the truck. The load springs are of length which exceeds that of conventional load springs to attain softer, full-load cushioning. To avoid mispositioning of the car coupler at a greater height than allowed, the car truck includes cushioning devices between the bolster and the upper part of each side frame.

3,577,932
EXTERIOR COVER ENCLOSING HOPPER GATE AND ACTUATING MECHANISM
Frank C. Pulcrano, and Dallas W. Rollins, St. Charles, Mo., assignors to ACF Industries, Inc., New York, N.Y.
Filed Mar. 25, 1969, Ser. No. 810,197
Int. Cl. B61d *5/04, 5/08, 7/22*
U.S. Cl. 105—253 **7 Claims**



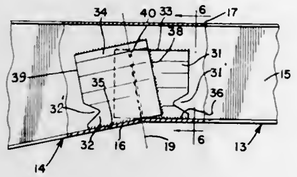
A lower generally pan-shaped cover for fitting around the entire bottom discharge structure of a railway hopper car, such as a discharge structure having a gravity gate and a combination rack-and-pinion drive for the gravity gate. The cover seals the entire bottom outlet structure against the entrance of foreign matter including the drive means. Means mount the cover for movement between a covering position with respect to the bottom outlet and a position removed from beneath the bottom discharge outlet to permit the discharge of lading. The cover is formed of fiber glass and resin binder to insulate the bottom discharge structure for minimizing heat losses from an insulated car. The capstans for rotating the pinion shaft are mounted for folding to an inoperative position in order for the cover to cover the drive means while remaining within clearance limits and without being of an unduly long length.

3,577,933
LIGHTWEIGHT RAILWAY CONTAINER CAR
Ray L. Ferris, Thornton, Ill.; William R Shaver, Munster, Ind., and William P. Manos, Chicago, Ill., assignors to Pullman Incorporated, Chicago, Ill.
Filed Dec. 5, 1968, Ser. No. 781,337
Int. Cl. B65j *1/22*
U.S. Cl. 105—366 **18 Claims**



A railway car of lightweight design consisting of a skeletal fishbelly structure having at opposite ends an end frame structure including a boxlike center sill. A boxlike transition structure connects the end frame structure to an intermediate structure which includes a pair of longitudinally extending spaced-apart webs having relatively narrow horizontal top and bottom flanges providing side sill members. The end structures include crossmembers which provide end sill platforms which support container brackets. Additional container brackets are supported alongside the side sill members for supporting containers of various lengths and a latticework structure replaces the conventional deck plate structure and is connected to the top and bottom flanges to stabilize the container brackets and the structure at the loading points.

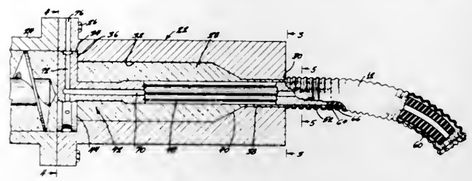
3,577,934
TRANSITION REINFORCEMENT FOR FISHBELLY UNDERFRAME
Jack E. Gutridge, Dyer, Ind.; Kent N. Johnson, South Holland, and John H. Spence, Chicago Heights, Ill., assignors to Pullman Incorporated, Chicago, Ill.
Filed Aug. 28, 1968, Ser. No. 755,880
Int. Cl. B61f *1/02*
U.S. Cl. 105—414 **7 Claims**



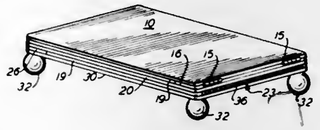
A railway car underframe of the fishbelly type wherein transition sections connected between the end section and a center section include a reinforcement structure in the area of the transverse bend line of the bottom plate, the structure comprising upright plates located between and connected to spaced vertical webs of the underframe, with the plates extending longitudinally with the webs, and having their lower edges connected to the bottom plates on longitudinally spaced opposite sides of the bend line, said structure improving the stress distribution on the transition section bottom plate.

3,577,935
EXTRUSION APPARATUS
Richard D. Reinhart, and Robert O. Straughn, Minneapolis, Minn., assignors to General Mills, Inc.
Filed Feb. 1, 1967, Ser. No. 613,254
Int. Cl. A21c *11/16*
U.S. Cl. 107—14 **12 Claims**

An apparatus and method for extruding an elongated, tubular, corrugated product having a plurality of longitudinally extending indentations or depressions on its surface. Extrudable material is forced through an extrusion apparatus having an annular extrusion orifice formed by a die opening in the extrusion apparatus, and a mandrel having its projecting end positioned in the opening. Either the shape of the die opening or the shape of the mandrel is formed in such a manner that the thickness of the space surrounding the mandrel varies at a number of different points. A product made by using this apparatus has a somewhat coblike appearance.

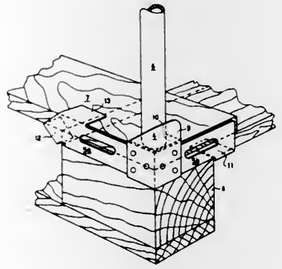


3,577,936
STOOL OR LEG REST
William M. Emery, 44 Pittsford Way, New Providence, N.J.
Filed Jan. 10, 1969, Ser. No. 790,348
Int. Cl. A47c *7/50*
U.S. Cl. 108—8 **1 Claim**



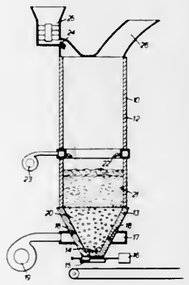
A stool or leg rest widely adjustable as to height and angle having but few simplified basic parts, i.e. 3 similar ¼-inch plywood platens coinciding when adjacent, their ends interjoined by hinges, two sets of plywood diecut and inwardly directed ratchet teeth made integral with the upper side of two platens to coincide with the longer edges thereof and two U-pawls nested intermediate of said ratchets when platens are adjacent, journaled on the undersides of two of the platens facing the ratchets, and gravity responsive when the leg rest is being Z-extended.

3,577,937
CORNER POST SUPPORT, PREFERABLY FOR LOAD PALLETS
Ake E. Sjoblom, Orebro, Sweden, assignor to Aktiebolaget Grythyttans Stalmobler, Grythyttan, Sweden
Filed Apr. 8, 1969, Ser. No. 814,316
Claims priority, application Sweden, Apr. 8, 1968, 4,700/1968
Int. Cl. B65d *19/18*
U.S. Cl. 108—53 **10 Claims**



A detachable corner post support for a load pallet. A bracket is bent at an angle to fit against the two vertical sides of the pallet which form the corner, and the bracket extends above the load supporting surface of the pallet. A corner plate attached to the inside of the bracket lies against the top of the load supporting surface and forms with the inside of the bracket a three-sided mounting for a corner post. Two attachment wings are attached to the bracket and extend one along each of the vertical sides which form the corner and in a direction away from the corner. Hook-formed elements extend from each wing inwardly beneath the load supporting surface and generally perpendicular to its respective vertical side, each hook-formed element engaging a side of the corner foot of the pallet which lies at an angle to its respective vertical side. The hook-formed element of at least one attachment wing is movable out from its position perpendicular to its respective vertical side to facilitate assembling the corner post support onto the pallet.

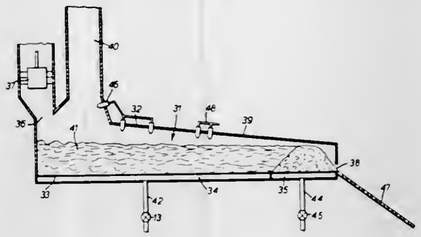
3,577,938
INCINERATORS
Duncan Ronald Muirhead, Narrow Lane, near Ferribly, and John Francis Richardson, Swansea, South Wales, England, assignors to Rose, Downs & Thompson Limited, Kingston-upon-Hull, Yorkshire, England
Filed May 8, 1969, Ser. No. 822,975
Claims priority, application Great Britain, May 10, 1968, 22,424/68
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 **8 Claims**



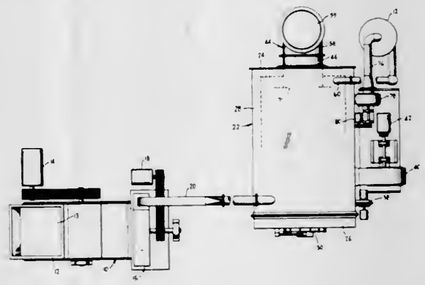
In a method of disposing of town refuse the refuse is burnt in an incinerator whilst supported on a nonfluidized mass of refractory granular material and the granular material is periodically fluidized to allow the noncombustible content of the refuse to pass therethrough and be removed from the incinerator through an outlet. The mass of refractory granular material serves as a valve for permitting the noncombustible content of the refuse which collects on the surface of the granular material to pass therethrough and be removed from the incinerator.

3,577,939
INCINERATORS
Duncan Ronald Muirhead, Narrow Lane, near Ferriby, England, assignor to Rose, Downs & Thompson Limited, Kingston-upon-Hull, Yorkshire, England
Filed May 8, 1969, Ser. No. 822,977
Claims priority, application Great Britain, May 10, 1968, 22,412/68
Int. Cl. F23g *5/00*
U.S. Cl. 110—8 **8 Claims**

In a method of disposing of town refuse, the refuse is burnt whilst supported in an incinerator by a fluidized bed of refractory granular material and the bed is separated from an outlet of the incinerator container by a mass of refractory granular material which is periodically fluidized to allow the noncombustible content of the refuse to pass therethrough and be removed from the incinerator through the outlet. The mass of refractory granular material may form an extension of the bed which supports the refuse whilst it is burnt with the mass of granular material positioned between the part of the bed which supports the refuse and an outlet from the incinerator container.



3,577,940
INCINERATOR
Robert Joel Hasselbring, Shelbyville, and Robert Loren Shields, Rushville, Ind., assignors to General Electric Company
Filed Oct. 27, 1969, Ser. No. 869,823
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 **23 Claims**

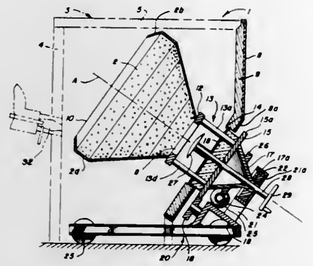


An incinerator for burning waste material includes a combustion chamber having spaced end walls and a sidewall through which a mixture of waste material and air is introduced under pressure tangentially for establishing a vortical movement of the waste material toward one of the end walls. The waste material is ignited during its vortical movement and the chamber includes a discharge flue at the one end wall which is concentric with the central axis of the chamber and which has an open end in the chamber spaced axially of the one end wall. A second discharge port adjacent the one end wall extends tangentially through the sidewall for discharging from the chamber products residual combustible material and noncombustible material entrained in the outer region of the vortex. The discharged material is conveyed through a conduit to a separator which separates the discharged gases and solid material. The separated gases and any solid particles suspended therein are introduced back into the chamber. A baffle is mounted on the flue adjacent its open end for deflecting outwardly toward the sidewall solid material which moves from adjacent the one end wall toward the open end of the flue.

3,577,941
INCINERATOR
Fritz Schoppe, Ebenhausen, Germany, assignor to Aqua-Chem, Inc.
Filed May 19, 1969, Ser. No. 825,865
Claims priority, application Germany, June 21, 1968, P 17 51 574.1
Int. Cl. F23g *5/06*
U.S. Cl. 110—14 **6 Claims**

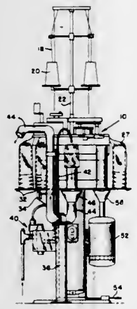
An improved maintenance system in a pyrometric cone incinerator having a conical basketlike hollow body located in

a housing and having perforated walls. The basketlike hollow body is positioned rotatably about an axis inclined at an angle to the horizontal line and has an obliquely upwardly directed large feed opening and an obliquely downwardly directed smaller discharge opening. The discharge opening is aligned with a bar cage attached to the lower end of the conical body and coaxial therewith. The outer end of the bar



cage is rotatably supported on a suitable bearing which supports the body and the bar cage on a portable frame. An access door is provided in the lower axial discharge opening of the conical body. An operating means including an operating shaft extends axially outwardly from the access door through the bar cage, drive means and bearing means to an external operating handle.

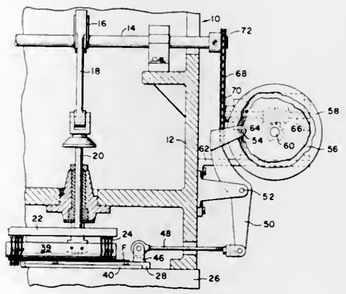
3,577,942
APPARATUS FOR CLOSING HOSIERY TOES AND EVERTING HOSIERY AND METHOD
Dalton O. Hulin, Lexington, N.C., assignor to Sliver Knit Hosiery Mills, Inc., High Point, N.C.
Filed July 30, 1969, Ser. No. 846,051
Int. Cl. D05b *7/00;* **A41h** *43/00*
U.S. Cl. 112—25 **11 Claims**



A method and apparatus for turning socks wherein open-toe socks are everted to wrong side out condition and impaled upon points of a rotary dial for the formation of a toe closure. Means are provided to evert the toe-closed socks to their original right side out condition after the toe-closing operation.

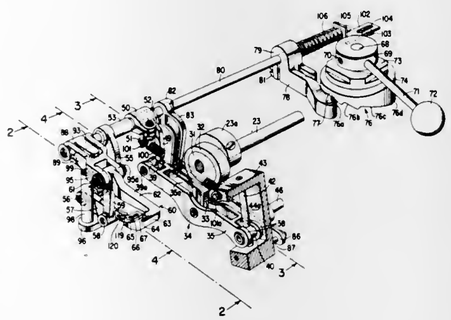
3,577,943
DENSE PILE TUFTING MACHINES
Charles William Watkins, Hixson, Tenn., assignor to The Singer Company, New York, N.Y.
Filed Apr. 3, 1969, Ser. No. 813,130
Int. Cl. D05c *15/28*
U.S. Cl. 112—79 **16 Claims**

This disclosure relates to tufting machines for producing dense pile fabrics and more particularly those of the cut pile type. In general, the machine includes apparatus for shifting the backing fabric used in the tufting process relative to the needles, loopers, and cutting mechanism. Through the novel arrangement of the shifting mechanism and the tufting components, as set forth in this disclosure, a dense pile fabric is produced having rows of pile tufts which are spaced less than the distance of the spacing between adjacent needles as viewed in the direction of the backing fabric feed. As is known in the art, the guage of the machine is measured by



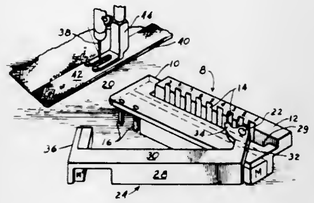
the transverse spacing between adjacent needles. The longitudinal rows of tufting produced through the apparatus of the present disclosure are spaced less than the guage distance. The disclosure further presents a commercially desirable machine of the so-called sliding needle plate type which produces a cut pile fabric.

3,577,944
UNDERTRIMMER MECHANISM FOR SEWING MACHINES
Erich M. Willenbacher, Karlsruhe; Ulrich Schmedtkord, Badenwuerttemberg, and Dieter K. Gabler, Neudorf, Germany, assignors to The Singer Company, New York, N.Y.
Filed Oct. 7, 1969, Ser. No. 864,447
Int. Cl. D05b *37/02*
U.S. Cl. 112—127 **11 Claims**



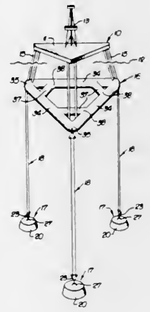
A trimming mechanism for a sewing machine for severing the marginal edge of the lower ply of material being seamed. Oscillatory movement is imparted to the trimming blade by a series of arms driven off an eccentric on the sewing machine bed shaft. An operator-controlled cam member is operatively connected through its follower to mechanism which changes the relative position of the arms to vary the stroke of the trimming blade and also change its vertical elevation so that the blade at the bottom of its cutting stroke is at the same elevation for any stroke selected.

3,577,945
ADJUSTABLE GAGE FOR SEWING MACHINES
Arthur Kalish, 64-10 Dieterle Crescent, Rego Park, N.Y.
Filed Jan. 16, 1969, Ser. No. 791,713
Int. Cl. D05b *35/10*
U.S. Cl. 112—153 **2 Claims**



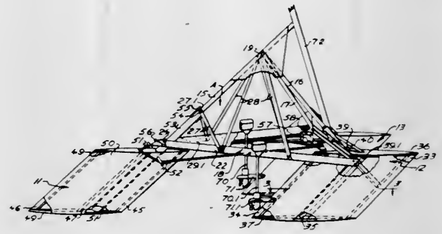
A sewing machine gage for controlling the distance between a stitch and edge of thin, delicate fabric, as well as heavier fabrics. The gage comprises a frame member provided with a magnetized bar for securing the gage against lateral displacement on a sewing machine table. A pair of pins secured to the frame are received in the sewing machine table to prevent the lateral displacement of the gage. A ferrous gage member is slidably and pivotably mounted on the frame to permit its adjustment at a desired position. The gage member is provided with a gage foot and a magnetized element for holding down the gage foot in intimate engagement with the table surface of the sewing machine. The magnetized bar holds the ferrous gage member in a selected position at a selected distance from the stitch.

3,577,946
STABLE MARINE CONSTRUCTION
Edward E. Horton, Portuguese Bend, Calif., assignor to Deep Oil Technology, Inc., Long Beach, Calif.
Filed Feb. 6, 1969, Ser. No. 797,121
Int. Cl. B63b *35/44;* **E02b** *17/00*
U.S. Cl. 114—0.5 **10 Claims**



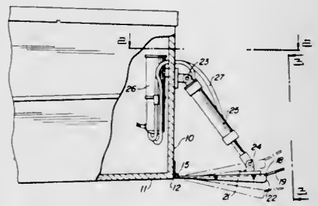
A marine construction and a mooring system therefor for supporting an above surface working platform wherein the marine construction comprises a stable determinate structure held by anchor means and by tension means interconnecting the anchor means and structure for positioning the marine structure a selected distance below the surface of the water. The submerged marine structure includes a plurality of main buoyant members forming a continuous peripheral buoyant means of selected cross-sectional configuration whereby cyclic stresses imparted to the structure and tension means by wave action are minimized and reduced. The submerged buoyant means also includes internal buoyant members symmetrically disposed with respect to the main buoyant members and arranged to interconnect corresponding portions of main members for enhancing stability of the construction under different conditions.

3,577,947
MULTIPLE HULL BOAT
Gordon L. Draeseke, 1599 Angus Drive 9, Vancouver, British Columbia, Canada
Filed Apr. 28, 1969, Ser. No. 819,603
Claims priority, application Great Britain, May 17, 1968, 23484/68
Int. Cl. B63b *1/10*
U.S. Cl. 114—61 **7 Claims**



A water craft having a rigid superstructure supported by three deep draft pontoons arranged in a triangular configuration with two forward and one aft, the aft pontoons are elongated in both fore-and-aft and vertical directions and have sidewalls extending in a substantially straight line configuration from top to bottom so as to have a substantially linear depth-buoyancy ratio.

3,577,948
STABILIZER TRIM ATTACHMENT FOR POWER BOATS
Ellsworth J. Frey, Logan, Ohio, assignor to Star Tab, Inc., Logan, Ohio
Filed Apr. 11, 1969, Ser. No. 815,404
Int. Cl. B63b *1/22*
U.S. Cl. 114—66.5 **1 Claim**

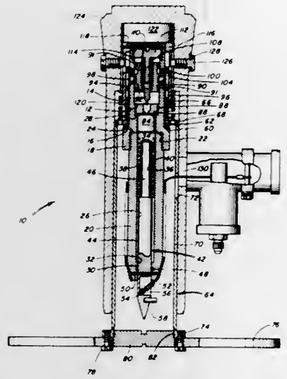


An attachment for a power boat which fits on the transom or stern of the boat and comprises a pair of trim tabs hinged at the transom and extending rearwardly therefrom, and which may be swung vertically simultaneously to different angular positions to trim the boat so that it operates at the proper attitude regardless of its loading. The tabs are so formed that they also bring about lateral stability as well as impart the proper attitude to the boat. Furthermore, the tabs are positively moved vertically up or down to their selected angular positions.

3,577,949
EXPLOSIVELY PROPELLED UNDERWATER EMBEDMENT ANCHOR ASSEMBLY
Kenneth E. Mueller, Baltimore City; John L. Critcher, Cockeysville; Franklin A. Monson, Glenarm; William H. Turnbaugh, Cockeysville, and John E. Kosloski, Timonium, Md., assignors to the United States of America as represented by the Secretary of the Navy
Filed June 19, 1968, Ser. No. 740,817
Int. Cl. B63b *21/28, 21/26;* **F41c** *27/00*
U.S. Cl. 114—206 **12 Claims**

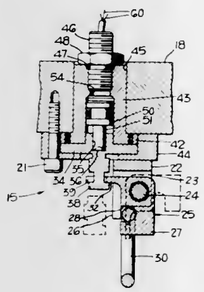
An explosively propelled underwater embedment anchor assembly having a barrel with a smooth bore therethrough except for an internal flange near the muzzle extremity; a

breech at the other end of the barrel; an explosive propellant cartridge within the barrel and adjacent the breech; a piston also within the barrel and adjacent the breech but on the muzzle side thereof, the piston having an outside diameter approximately equal to the diameter of the smooth bore; and



a harpoon adjacent the piston and extending out of the barrel, the harpoon having a maximum outside diameter approximately equal to the inside diameter of the flange. A spring-biased firing pin is restrained by a plurality of ball lock detents held in place by a resiliently biased tube.

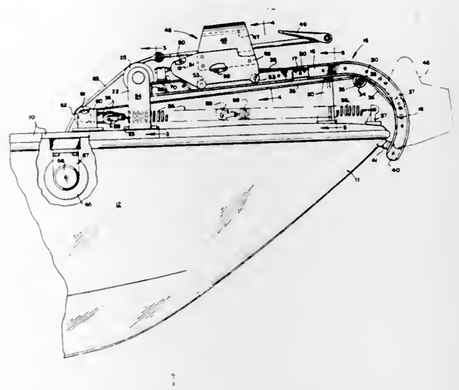
3,577,950
UNDERWATER MOORING RELEASE DEVICE
William Gordon, 1173 Fountain Way, Anaheim, Calif.
Filed July 7, 1969, Ser. No. 839,266
Int. Cl. B63b *21/24;* **A44b** *13/00*
U.S. Cl. 114—206 **13 Claims**



An underwater mooring release device having an explosive-charge-actuated piston to shear a diaphragm and release toggle-type load retainer means. Control for the explosive charge is enclosed in a housing which remains sealed after detonation of the explosive charge and release of the tethered load. Simple clamping means releases the components for servicing and reconditioning after a use cycle.

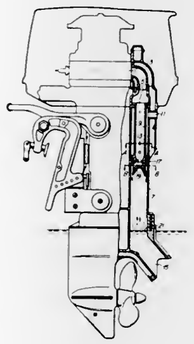
3,577,951
APPARATUS FOR STOWING AND DROPPING AN ANCHOR
Erwin M. Smith, Rte. 1, Box 355, Camas Valley, Oreg.
Filed Mar. 19, 1969, Ser. No. 808,529
Int. Cl. B63b *21/22*
U.S. Cl. 114—210 **4 Claims**

An apparatus is disclosed located on the forward deck of a boat and operable to position an anchor from a stowed location over the deck to a dropping position. An anchor carriage is mounted for travel along a rail structure having a curved segment located adjacent the boat's prow whereat the carriage discharges the anchor and oppositely receives the anchor during stowing of same. The anchor carriage is posi-



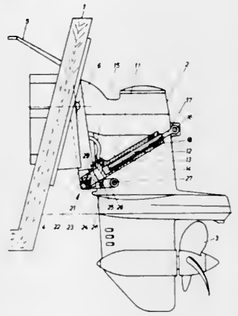
tionable forward to an anchor discharge position by spring means which means is loaded by powered retrieval of the anchor and the anchor carriage to a rearward stowed position. Powered winch means are also disclosed.

3,577,952
EXHAUST SYSTEM OF PROPELLER FOR SHIPS
Hiroshi Tado, Suita-shi, Japan, assignor to Yanmar Diesel Engine Co. Ltd., Kita-ku, Osaka, Japan
Filed Sept. 22, 1969, Ser. No. 859,744
Claims priority, application Japan, Sept. 30, 1968, 43/85326
Int. Cl. B63h *21/34*
U.S. Cl. 115—17 **1 Claim**



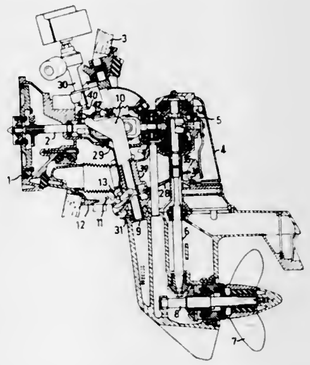
An exhaust tube is mounted in an exhaust pipe connected to the exhaust port of the engine of a propeller apparatus. A deflector member defining obliquely radially extending channels and having a concaved outer surface is provided at the lower end of the exhaust tube integrally therewith, so as to divert the path of gas flow in the exhaust pipe and also repulse the water particles sucked up by being entrained by the wave of negative pressure of the engine reflecting on the surface of water present in the lower portion of the exhaust pipe.

3,577,953
LIFTING APPARATUS FOR OUTBOARD MOTORS
Siegfried Braun, and Heinz Hieber, Friedrichshafen, Germany, assignors to Zahnradfabrik Friedrichshafen, Aktiengesellschaft, Friedrichshafen, Postfach, Germany
Filed May 20, 1969, Ser. No. 826,100
Claims priority, application Germany, Jan. 8, 1969, P 19 00 710.4
Int. Cl. B63h *5/12*
U.S. Cl. 115—41 **8 Claims**



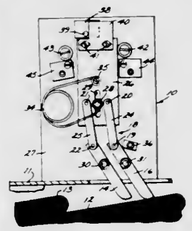
An outboard motor is conventionally supported to swing on vertical and horizontal axes. A pressure fluid cylinder and piston is arranged between the motor and the support which carries it. A latch device is likewise provided between the motor and support which automatically locks them together when the motor is in normal operating position. However, the latch device is automatically released via a lost motion device when the cylinder is initially pressurized. Continued pressurization raises the motor through takeup of lost motion in the device, for operation in shallow water or for any other purpose.

3,577,954
TILT LATCHING AND LOCKING MEANS FOR TILTABLE STERN DRIVES FOR BOATS
Kjell Borgersen, Gothenburg, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden
Filed July 7, 1969, Ser. No. 839,219
Int. Cl. B63k *5/12*
U.S. Cl. 115—41 **8 Claims**



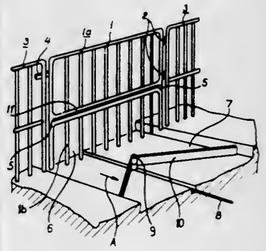
A tilt lock for motor boat stern drives of the type comprising a downwardly extending leg having propeller means at its lower end portion and pivotally connected to the boat at its upper portion on an axis extending laterally of the boat keel for tilting upwardly and rearwardly. The tilt lock comprises pivoted arms preferably carried by the leg having notches therein for receiving a pin preferably carried by the boat in a selectable position. The notches are provided with cam surfaces which engage the pin during forward propulsion in a direction to force the arms away from the pin, whereby sudden tilting of the leg moves the arms away from the pin before biasing means are effective to swing the arms into position to nest the pin in the notches. A latch member is pivotally carried by the arms and biased in position to retard escape of the pin from the notches but yieldable to permit such escape when the leg is forced to tilt. A lock member is arranged for selective swinging into the path of yielding movement of the latch, and the lock member is operably connected to reverse gear shifting means to lock the latch member in retaining position during reverse operation of the propeller means.

3,577,955
DISCONTINUITY SENSOR
Charles G. Palmer, Orange, Calif. (1628 E. Stafford, Santa Ana, Calif. 92667)
Filed June 19, 1968, Ser. No. 738,251
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 **13 Claims**



This invention relates to discontinuity or surface irregularity sensors. Three embodiments are illustrated and described. All three illustrate application of the invention to the task of counting articles, such as newspapers, being conducted along a conveyor. Each of these three embodiments includes two surface or contour follower elements spaced apart in the direction of conveyor movement and individually mounted for movement in a degree corresponding to the value of that dimension in which discontinuities or surface irregularities are to occur. Means are provided for sensing the difference in movement of the follower elements and for providing a signal upon the occurrence of a selected difference.

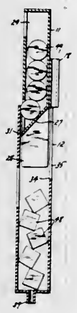
3,577,956
PARTITION WALL FOR SHEDS HAVING AUTOMATIC DUNG SCRAPER
Adolf G. Forster, Augsburg, Germany, assignor to Alfa-Laval AB, Tumba, Sweden
Filed May 16, 1969, Ser. No. 825,160
Claims priority, application Germany, May 17, 1968, A29790/45hGhm
Int. Cl. A01k *1/00*
U.S. Cl. 119—15 **11 Claims**



The shed floor includes a cleaning area along which a scraper is movable automatically to remove dung. A partition wall has an opening located above the cleaning area and so dimensioned as to permit a reclining animal to pass through the opening in the event that the animal is entrained by the

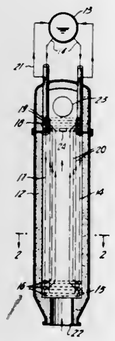
scraper. While thus passing through the opening, the reclining animal displaces a yieldable barrier means from its normal position extending across the opening, the barrier means having a lower edge spaced above the cleaning area a sufficient distance to permit the scraper to pass freely under the barrier means.

3,577,957
ANIMAL FEEDER HAVING ADJUSTABLE TIMING MEANS
Henry Sandig, 38 Park Row, New York, N.Y.
Filed Sept. 9, 1969, Ser. No. 856,357
Int. Cl. A01k *5/02*
U.S. Cl. 119—51.11 **3 Claims**



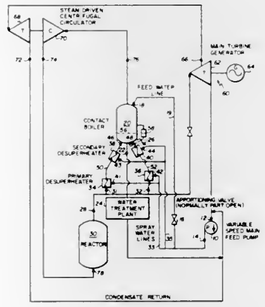
An automatic animal feeder comprising upper and lower container elements, the upper container element being adapted to contain food, the lower container element containing a meltable solid or solids and having drainage means for the resultant melted fluid after said solids have melted. Resilient means urge the containers into mutually telescoped relation. Each container includes an opening alignable with an opening in the other container to provide a passage through which food may be discharged, whereby with the melting of the meltable solids in the lower container and melting fluid discharged therefrom, the lightening of the effective weight and the diminishing of the space between the containers permits the resilient means to progressively telescope the container elements to align the openings for this purpose.

3,577,958
STEAM BOILER HEATED BY WASTE HEAT
Shozo Narita; Masaki Ojima, and Asahiko Shiraishi, Kobe City, Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe City, Japan
Filed Feb. 12, 1969, Ser. No. 798,681
Claims priority, application Japan, Feb. 14, 1968, 43/9283
Int. Cl. F22b *1/18*
U.S. Cl. 122—7 **6 Claims**



Process gas of high temperature and under high pressure from naphtha reformers or the like is used in a heat-exchanging steam boiler for generating steam for the use in the reforming process itself and for other purposes such as in steam turbines whereby the hot gas is cooled at the same time.

3,577,959
SATURATED STEAM SUPPLY SYSTEM FOR A STEAM COOLED FAST BREEDER REACTOR
Robert Owen Barratt, Parsippany, and John Polcer, Florham Park, N.J., assignors to Foster Wheeler Corporation, Livingston, N.J.
Filed Aug. 5, 1968, Ser. No. 750,185
Int. Cl. F23b *1/08*
U.S. Cl. 122—31 **16 Claims**

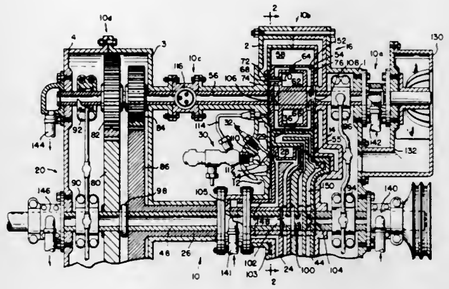


A saturated steam supply system for a steam cooled fast breeder reactor power plant having mechanical spray desuperheaters for the first and second stage of desuperheating the reactor core superheated coolant steam and a bubble-through steam washing and final desuperheater contact boiler. The contact boiler having a vertically extending cylindrical vessel with a steam inlet at its lower level for receiving the two-stage desuperheated steam and directing it through a plurality of vertical concentric tube manifolds of ascending reduced cylindrical sizes which distribute the steam in bubble trays has bubble caps. The vessel also has a feed water inlet at its upper level for feed water which cascades from bubble tray to bubble tray for steam washing and final desuperheating of the steam. The steam is directed through mechanical separators and dryers and then leaves the contact boiler at the upper level of the vessel to be used as saturated steam coolant for the fast breeder reactor.

3,577,960
ROTARY ENGINE
John Wiley, Seattle, Wash., assignor to Skrob, Inc., Seattle, Wash.
Continuation of application Ser. No. 773,562, Nov. 5, 1968, now abandoned. This application Apr. 20, 1970, Ser. No. 302,286
Int. Cl. F02b *55/00*
U.S. Cl. 123—8.09 **7 Claims**

A rotary internal combustion engine of the type having a central combustion rotor containing peripheral combustion chambers, a planetary piston means having at least one piston revolvable around the combustion rotor in an annular piston chamber, and at least one cutoff rotor cooperable with the piston and combustion rotor to provide compression and expansion zones in the annular piston chamber is provided

with a through power output shaft, internal liquid cooling and a pressurized air accumulation chamber, and additional



combustion chambers designed to enhance engine stability, fuel injection and efficiency.

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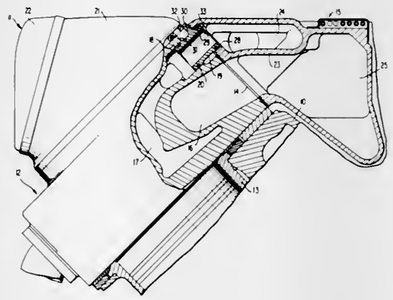
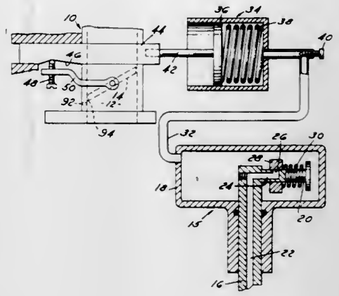
3 ,577,961
LIQUID-COOLED SUPERCHARGED INTERNAL COMBUSTION ENGINE
Herbert Deutschmann, Stuttgart-Bad Cannstatt, and Ulrich Conrad, Ludwigsburg-Ossweil, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany
Filed Mar. 14, 1968, Ser. No. 713,177
Claims priority, application Germany, Mar. 17, 1967, D52558la
Int. Cl. F02b *29/04;* **F01p** *1/06;* **F16l** *27/12*
U.S. Cl. 123—52 **15 Claims**



A liquid-cooled super-charged internal combustion engine in which the line for the compressed combustion air and the line for the cooling liquid are connected, prior to entry into the engine, to an elbow-housing that has two channels with a common separating wall for the heat-exchange between cooling liquid and air.

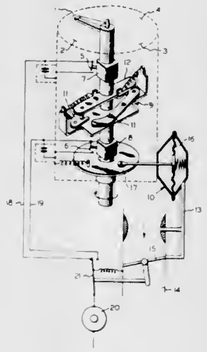
3,577,962
THROTTLE BLADE CONTROL SYSTEM FOR MINIMIZING VARIATIONS IN IDLING SPEED
William K. Ojala, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Oct. 20, 1969, Ser. No. 867,474
Int. Cl. F02d *11/08*
U.S. Cl. 123—103 **12 Claims**

A cam having an effectively V-shaped cam surface is positioned by engine intake manifold pressure modulated according to engine speed above a predetermined value to control the idling position of the carburetor throttle blade. Engine idling speed resulting from the system is constant within 60 r.p.m. for all conditions of engine temperature and the number of actuated engine driven accessories. The system



also opens the throttle blade slightly during engine deceleration to improve exhaust emissions.

3,577,963
CONTROL FOR INTERNAL COMBUSTION ENGINES
Rudolf Bechmann, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany
Filed May 17, 1968, Ser. No. 730,053
Claims priority, application Germany, May 27, 1967, P 15 76 689.9
Int. Cl. F02b *5/00*
U.S. Cl. 123—117.1 **1 Claim**

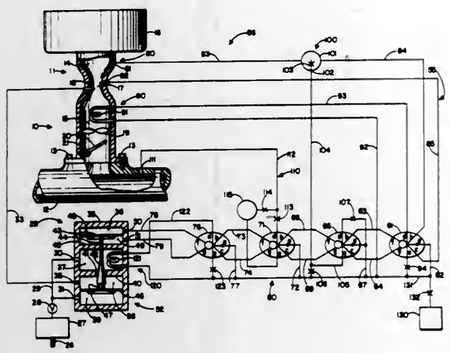


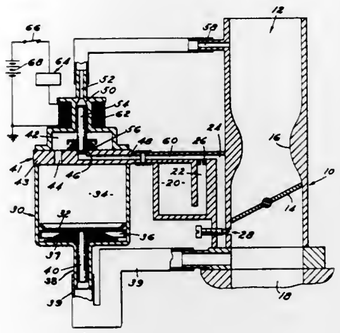
A distributor for internal combustion engines having a centrifugally operated and a vacuum operated spark timing control with a switch in the primary circuit of an ignition coll operated by a throttle valve and the switch connected to a circuit breaker system controlled by centrifugal operation and a further circuit breaker system connected and influenced by a vacuum operated control.

3,577,964
CONTROL APPARATUS
Jeffrey M. Lazar, Rosemount, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Apr. 17, 1968, Ser. No. 721,994
Int. Cl. F02m *17/04*
U.S. Cl. 123—119 **8 Claims**

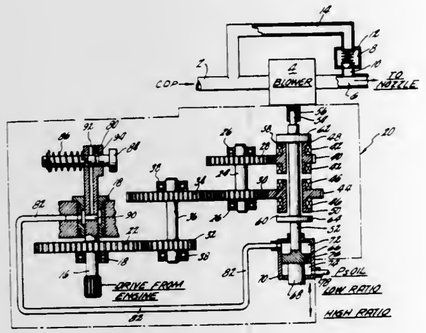
A fluidic fuel control system wherein mass fuel flow into a

mixing chamber is controlled in response to volumetric flow rate, temperature and pressure of air entering the chamber.





3,577,965
FUEL ATOMIZATION SYSTEM HAVING A COMPRESSOR DRIVE MEANS
Jack G. Sundberg, Meriden, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.
Filed Aug. 8, 1969, Ser. No. 848,557
Int. Cl. F02p *5/04*
U.S. Cl. 123—119 **3 Claims**

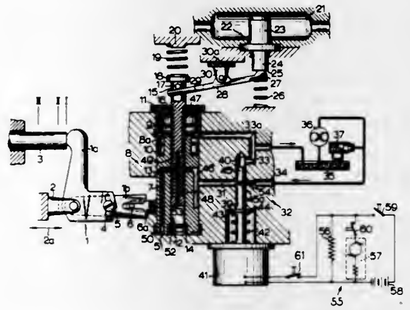


A boost compressor for aiding the atomization of fuel supplied through a nozzle to the combustor of a variable speed power source is provided with a pair of gears fixed for independent coaxial rotation about a driven member slideably connected to the boost compressor. Each of the gears is driven at a different rotational speed by a gear train directly connected to said variable speed power source. A separate clutch independently engages and disengages each of said gears and said driven member in response to axial movement of said driven member caused by pressurized fluid directed to a piston connected to said driven member by a speed responsive fluid transfer switch.

3,577,966
ENGINE ANTIDIESELING DEVICE
Wilford R. Collingwood, Dearborn; William M. Hutchison, Allen Park, and Frank E. Mangas, Southfield, Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Dec. 12, 1969, Ser. No. 884,444
Int. Cl. F02m *7/06;* **F02d** *31/00, 13/08*
U.S. Cl. 123—124B **7 Claims**

A container stores a small quantity of air and pumps the air into the idling system of a carburetor when the engine ignition system is turned off. The air reduces the supply of idling fuel to the engine for a time period sufficient to stop engine dieseling. An electrical solenoid valve connected to the engine ignition system controls the injection of the air into the idling passage.

3,577,967
CONTROL DEVICE FOR FUEL INJECTION PUMPS
Heinrich Staudt, Markgroningen-Talhausen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed June 9, 1969, Ser. No. 831,470
Claims priority, application Germany, July 13, 1968, P 17 51 701.0
Int. Cl. F02d *31/00*
U.S. Cl. 123—140 **9 Claims**

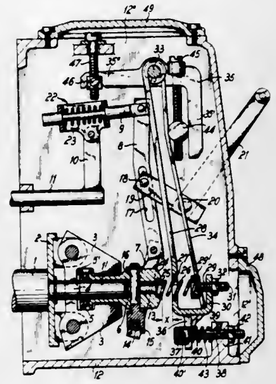


A fuel quantity control device for fuel injection pumps, wherein the maximum "open" position of a fuel quantity regulating member is limited by an abutment member movable by a piston which is displaceable by hydraulic pressure against a return spring. The said hydraulic pressure is admitted to the piston by a control shuttle disposed within said piston and displaceable with respect thereto by a sensor responsive to a variable.

3,577,968
CENTRIFUGAL R.P.M. REGULATOR FOR INTERNAL COMBUSTION ENGINES
Heinrich Staudt, Markgroningen-Talhausen; Eberhard Hofmann, Kirchberg/Murr, Neuhof, and Rolf Muller, Stuttgart-Zuffenhausen, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed Oct. 1, 1969, Ser. No. 862,877
Claims priority, application Germany, Oct. 17, 1968, P 18 03 564.8
Int. Cl. F02d *1/04, 1/06*
U.S. Cl. 123—140(R) **8 Claims**

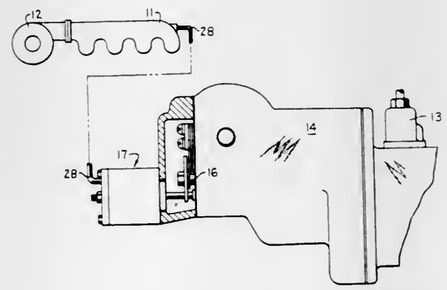
In a centrifugal r.p.m. regulator for internal combustion engines, the governor sleeve is connected to a fuel quantity

control member through a linkage assembly that includes an intermediate lever coupled to a manually operable lever to arbitrarily adjust said fuel quantity control member. The r.p.m. regulator includes a spring-loaded support arm against which the governor sleeve is adapted to abut after traveling a



predetermined distance under the force exerted by the centrifugal weights as the engine r.p.m. increases. Beyond a predetermined r.p.m. the last-named force overcomes the force of the support lever spring thus permitting the governor sleeve to be further displaced, shifting thereby said control member to lessen the injected fuel quantities.

3,577,969
VARIABLE GOVERNOR LIMITING MECHANISM
Stanley J. Kranc, Morton, and Ziedonis I. Krauja, East Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed June 23, 1969, Ser. No. 835,413
Int. Cl. F02d *1/04, 1/06;* **F02b** *41/10*
U.S. Cl. 123—140 **3 Claims**

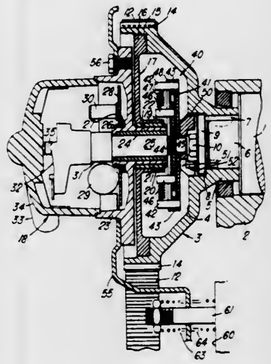


A variable limiting mechanism in combination with an engine governor having a movable control rod for establishing an optimum rate of fuel flow, the limiting mechanism being effective to vary the optimum governor setting according to the amount of pressure available within the air inlet manifold for the engine. The limiting mechanism includes a diaphragm member arranged for movement within a housing and defining a first chamber in communication with the air inlet manifold and a second hermetically sealed chamber. A link is secured for movement with the diaphragm member and includes means for limiting motion of the control rod in one direction.

ERRATUM

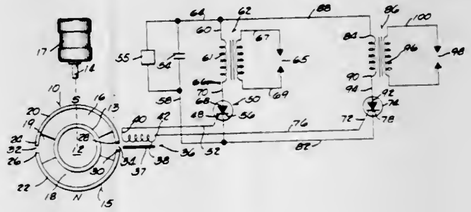
For Class 123—140 see:
Patent No. 3,577,978

3,577,970
INTERNAL COMBUSTION ENGINE IGNITION SYSTEMS
Maurice King, and Trevor Leslie Barber, Maulden, England, assignors to General Motors Corporation, Detroit, Mich.
Filed Sept. 22, 1969, Ser. No. 859,648
Claims priority, application Great Britain, Sept. 27, 1968, 45,922/68
Int. Cl. F02p *1/00*
U.S. Cl. 123—146.5 **3 Claims**



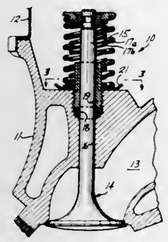
An ignition distributor is mounted on the front end of an overhead camshaft, the latter carrying a drive gear member which is recessed to house the centrifugal time control mechanism of the distributor and also having secured thereto a carrier member in which is journaled the housing of the distributor, the main shaft of which has a coaxial driving connection with the gear member and camshaft, and the housing being secured against rotation about the camshaft axis by a steady plate.

3,577,971
CONTACTLESS AND DISTRIBUTORLESS IGNITION SYSTEM
David T. Cavil, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Nov. 18, 1968, Ser. No. 776,379
Int. Cl. F02p *3/02*
U.S. Cl. 123—148 **13 Claims**



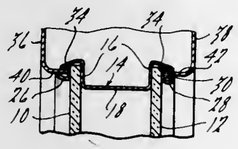
Disclosed herein is a contactless and distributorless capacitor discharge ignition circuit which is designed for an internal combustion engine and which employs a rotary pulse generator with a rotor which can be connected directly to the engine crankshaft for rotation therewith and which includes two circumferentially aligned magnet pole pieces in the form of circular ring sectors having a total angular span of slightly less than 360°. The ends of the pole pieces are spaced by narrow high reluctance gaps. The rotor induces one positive and one negative pulse in an adjacent trigger coil for each revolution to alternately make conducting two semiconductor switches to discharge a capacitor and create sequential ignition pulses in each of two ignition coils to fire spark plugs connected to the ignition coils.

3,577,972
ADJUSTABLE VALVE STEM OIL SEAL FOR INTERNAL COMBUSTION ENGINES
Forest J. Moray, 1513 Brooks Ave., Renton, Wash.
Filed July 6, 1970, Ser. No. 52,175
Int. Cl. F01l *3/00;* **F16k** *41/02*
U.S. Cl. 123—188P **15 Claims**



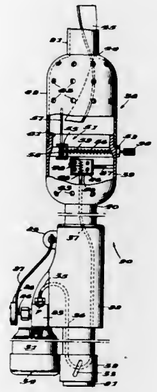
The disclosed valve stem seal in the head of an internal combustion engine comprises a packing around a valve stem with a packing gland thereon. The latter comprises a sleeve screwed in the head and slideable around the valve stem with gripping means on the upper end of the packing gland. Various gripping means include several different types of circular plates fitting around the packing gland and keyed thereto. The several plates have on their periphery either recesses, straight radial projections, or arcuate projections for the rotation thereof. Also one packing gland has radial projections formed around the upper surface thereof for being rotated for adjustment and another packing gland is keyed to the valve stem and a gripping surface formed on the top of the valve stem for being rotated. All gripping means permit rotation of the packing gland for adjusting the pressure on the packing as the latter wears with friction and without requiring the removal of the valve spring, resulting in a great saving in time and expense. This provides greater inducement for maintaining the valve seals tight and leak proof for the elimination of the smog problem, carbon monoxide, engine sludge, and excess oil usage.

3,577,973
OVEN DOOR WINDOW UNIT
Joseph W. Katona, Walled Lake, Mich., assignor to Mills Products, Inc., Farmington, Mich.
Filed Feb. 25, 1970, Ser. No. 14,107
Int. Cl. F23m *7/00*
U.S. Cl. 126—200 **4 Claims**



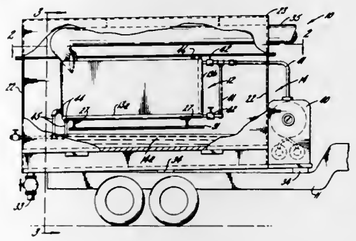
Window unit for an oven door in which a one-piece spacing and clamping member is disposed between a pair of glass panels to maintain the panels in sealed, spaced-apart relation, the spacing and clamping member having integral flanges extending across the peripheral edges of the panels with portions of the flanges crimped over the outer edges of the panels to clamp the latter to the spacer. Molding strips are clamped between the glass and the crimped portions of the flanges and are engaged by flanges on the oven door to locate the unit within the door opening.

3,577,974
SELF-CONTAINED HANDLE HEATER
Alvin M. Boldt, 820 Lariat Drive, Eugene, Oreg.
Filed June 27, 1969, Ser. No. 837,276
Int. Cl. A61f *7/06;* **F23q** *1/02*
U.S. Cl. 126—208 **6 Claims**



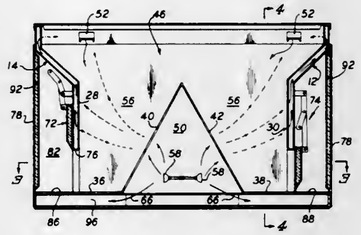
A handle heater fueled with liquefied petroleum gas contained in a cylinder secured in or on the handle with the flow of gas controlled by a hand-actuated valve. Means are provided for lighting the flame with a flint-type igniter. Accidental flow of fluid from the cylinder is prevented by the path of the conduit extending from the cylinder to the burner. Means extending through the handle provides a tortuous path for the products of combustion to evenly heat the handle. The handles are disclosed as fishing pole handles and golf cart handles.

3,577,975
SNOW MELTER
John F. Farsbetter, 2215 7th Ave., Rockford, Ill.
Filed May 2, 1969, Ser. No. 821,388
Int. Cl. E01h *5/10;* **F24h** *1/00*
U.S. Cl. 126—343.5 **7 Claims**



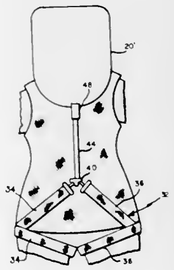
A snow melting container having as its bottom a rectangular steam jacket and as its sides vertically extending steam jackets. The side steam jackets are L-shaped and are mounted on the bottom jacket to form one end wall and two sidewalls leaving the other end of the container open. To increase the heating area of the bottom steam jacket, a number of vertically extending holes are formed through the jacket, and a baffle plate is suspended beneath the bottom jacket to catch any snow which might fall through the holes and to hold the snow until the latter melts. To divide the container into two compartments, a steam jacket is placed parallel with and midway between the portions of the L-shaped jackets forming the sides. The container is supported between the sides of a large tank and is located a predetermined distance above the bottom of the tank. A steam boiler generates steam which is piped to all the jackets under pressure and, through a valving system, the steam in the jackets is maintained at predetermined pressures.

3,577,976
HEATED ASPHALT STORAGE UNIT
Anton H. Heller, Levittown, N.Y., assignor to Poweray Infrared Corporation, Farmingdale, N.Y.
Filed July 23, 1969, Ser. No. 844,090
Int. Cl. E01c *19/45*
U.S. Cl. 126—343.5A **4 Claims**



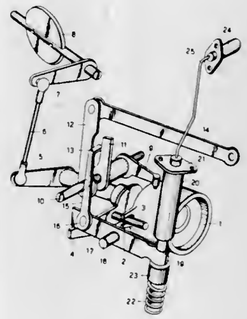
A unit for storing and maintaining asphalt at an elevated temperature as is necessary to facilitate making road repairs with this material, even in cold weather. Instead of applying heat insulation to the walls defining the asphalt storage compartment in an attempt to minimize heat loss therethrough, the storage compartment is enveloped within a body of heated air flowing at a controlled rate and the outer wall bounding the passage for this convection flowing heated air is insulated against heat loss. Thus, what would be an impractical insulated wall construction, both from the standpoint of the thickness and cost, in order to effectively minimize heat loss from a stationary heated body, such as the stored asphalt, is rendered well within practical requirements when it is applied and used for the continuously moving body of heated air. The enveloping heated air results in an optimum heat gradient about the heated asphalt and thus minimizes heat loss therefrom.

3,577,977
CARDIOVASCULAR CONDITIONING DEVICE AND PORTABLE RESPIRATOR
Frederick R. Ritzinger, Jr, Williams, Ariz.; Henry B. Whitmore, San Antonio; Paul M. Stevens, Houston; Gerald Garnder, Alvin; Leonard Harris, and Arnott A. Moore, San Antonio, Tex.
Filed Nov. 13, 1968, Ser. No. 775,406
Int. Cl. A61b *19/00*
U.S. Cl. 128—1 **1 Claim**



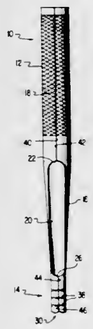
A positive pressure vest and helmet assembly is pressurized by introducing gases thereinto to produce pooling of blood in the subject's extremities causing the vascular muscles to exercise in order to compensate for conditions resulting from body changes which occur under zero gravity conditions.

3,577,978
A REGULATOR DEVICE FOR A VARIABLE RATE OF FLOW FOR A FUEL INJECTION PUMP FOR AN INTERNAL COMBUSTION ENGINE
Giampaolo Garcea, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy
Filed Apr. 1, 1969, Ser. No. 811,789
Claims priority, application Italy, Apr. 6, 1968, 14918A/68
Int. Cl. F02d *1/04*
U.S. Cl. 123—140 **1 Claim**



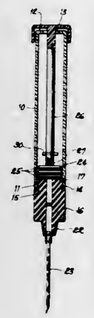
Regulator unit for a gasoline injection pump, which provides the automatic control of the idle running speed when the internal combustion engine has not reached its working temperature, comprising a thermostatic device which automatically moves a catch forming the limiting stop, which in turn controls the angle of opening of the throttle (or throttles).

3,577,979
DISPOSABLE SURGICAL SKIN PUNCH
Harry van der Gaast, 289 N. Hibiscus Drive, Miami Beach, Fla.
Filed Feb. 6, 1968, Ser. No. 703,286
Int. Cl. A61b *5/10*
U.S. Cl. 128—2 **6 Claims**



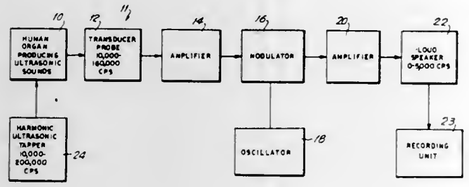
A disposable skin biopsy punch manufactured by forming a piece of sheet metal into a tubular member having a handle end and a cutting end. The cutting end terminates into an undulating cutting edge and includes means for retaining the skin plug within it and preferably having graduations or circumferential grooves for indicating the depth of cut or penetration. The skin punch is further provided with an axially extending scoop to allow observation of the cutting operation and may be produced with various size diameter cutting ends.

3,577,980
FLUID EXTRACTION DEVICE
Milton J. Cohen, 5437 Connecticut Ave., Washinton, D.C.
Filed May 28, 1968, Ser. No. 732,617
Int. Cl. A61m *1/00*
U.S. Cl. 128—2 **9 Claims**



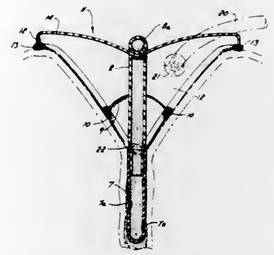
An instant vacuum fluid extraction device in the form of a vial sealed at one end by a valve and having an axially movable piston member therein shiftable from extended to retracted positions for generating a vacuum within the sealed container during movement to retracted position and means for latching the piston in its retracted position.

3,577,981
ULTRASONIC METHOD FOR DETECTING THE ACCUMULATION OF CHOLESTEROL AND OTHER DEPOSITS IN BLOOD VESSELS AND THE LIKE
Arthur Kuris, Riverdale, N.Y., assignor to Ultrasonic Systems, Inc., Plainview, N.Y.
Filed June 13, 1968, Ser. No. 736,761
Int. Cl. A61b *6/12*
U.S. Cl. 128—2R **21 Claims**



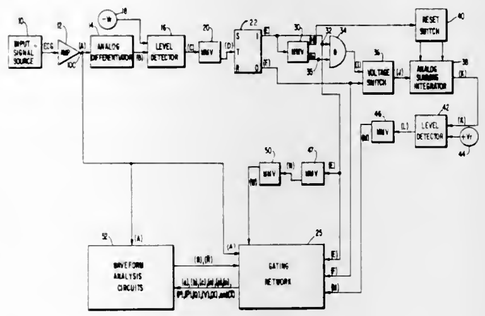
The invention relates to medical diagnosis by detecting the ultrasonic sounds that are present in humans and normally inaudible to the human ear and converting same into audible sounds for meaningful diagnostic information. In particular the invention relates to the detection of accumulated foreign deposits of material in vessels of living human beings, such as cholesterol in blood vessels, without causing any disruption or damage to the surrounding walls of the vessels, by detecting the ultrasonic vibrations as the blood flows therethrough and converting same to audible sound. The invention also relates to the introduction of ultrasonic energy waves into the body with the resultant creation of additional inaudible wave energy at a different frequency and then translating same into audible sound which the trained ear can diagnose.

3,577,982
EQUIPMENT FOR DELIVERING A LIQUID INTO A BODY STOMA
Edwin La Par, 542-B-1 Bellscourt, Salem Harbour Apts., Andalusia, Pa.
Filed Feb. 17, 1969, Ser. No. 799,748
Int. Cl. A61m *3/00, 25/02*
U.S. Cl. 128—2R **13 Claims**



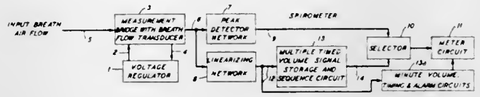
Equipment for delivering a liquid such as a barium solution into a body stoma such as the anus or the mouth of a colostomy, in which equipment provision is made for retaining the equipment in the desired position under the influence of reduced pressure or vacuum. A vacuum chamber for this purpose preferably substantially completely surrounds a catheter adapted to be inserted into the stoma, the vacuum chamber being in spaced relation to the catheter so as to cooperate with areas of the body surface spaced from the stoma.

3,577,983
METHOD AND APPARATUS FOR AUTOMATICALLY SCREENING VARIABLY RECURRENT WAVEFORMS SUCH AS AN ELECTROCAROIAC SIGNAL
Lee R. Baessler, Torrance, Calif., assignor to Humetrics Corporation, Los Angeles, Calif.
Filed Nov. 6, 1968, Ser. No. 773,861
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 **34 Claims**



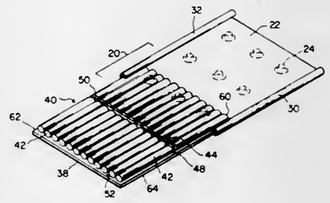
A method and apparatus including logic circuitry and interval detectors for selectively gating and evaluating subportions in individual cycles of a variably recurrent wave such as an electrocardiac signal. In distinction to attempting to subdivide such a variably recurrent signal in accordance with a running average rate, and in distinction to utilizing a measure of a preceding cycle time duration for setting desired gating periods to be applied in the immediately succeeding cycle for gating and measurement or evaluation, the present apparatus evaluates each subportion of the variably recurrent wave as a plurality of different subportions and displays one of the evaluations only after subsequent identification of the wave has been made relative to characteristically recurring points of inflection.

3,577,984
SPIROMETER
Donald Levy, Spring Valley, and Tibor Rusz, Sparkill, N.Y., assignors to Donti Research Development Manufacturing, Hackensack, N.J.
Filed Mar. 27, 1967, Ser. No. 626,240
Int. Cl. A61b *5/08*
U.S. Cl. 128—2.08 **29 Claims**



An electronic spirometer is disclosed for measuring a plurality of airflow and air volume parameters of a patient. A resistance measurement bridge having a transducer with a heated platinum wire is used to measure airflow. A detector network detects and stores the peak airflow. A linearizing network and a sequence and storage circuit convert the measured airflow into volume signals during successive intervals of a measurement cycle. A meter circuit is selectively controlled by the peak detector network and the storage circuit as well as the linearizing network and an averaging resistance capacitor arrangement for providing indications of the measured airflow and volumes.

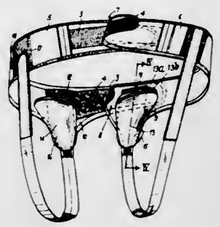
3,577,985
MASSAGING AND WASHING DEVICE
Margaret Alice Guffin, 128 Driscoll Ave., Rockville Centre, N.Y.
Filed Apr. 16, 1969, Ser. No. 816,639
Int. Cl. A61h *15/00*
U.S. Cl. 128—57 **9 Claims**



The invention is a back scrubbing and massaging means having a novel, nonbrush element comprising a plurality of deformable rollers loosely held within the framework of the device, adapted to be removably secured in a bathtub or on the wall of a standing shower in a position from which the bather can readily massage, scratch or wash his back by rubbing against the rollers without the use of his hands either on the invention or at his back. The invention also has a feature which permits the easy removal and replacement of the massaging, scratching and washing means from the frame or base of the invention.

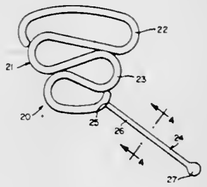
3,577,986
HERNIAL SUPPORT DEVICE
Leslie K. Regent, Nice, France, assignor to Surgical Developments Limited, Hersham, Walton-on-Thames, Surrey, England
Filed Jan. 13, 1969, Ser. No. 790,754
Int. Cl. A61f *5/28*
U.S. Cl. 128—96 **8 Claims**

A hernial support device consists of an abdominal belt from which one or two understraps are suspended by touch-and-close fasteners. Pads of foamed rubber are adjustably built up of laminar elements of flat and domed shapes by touch-and-close elements and attached to the understraps by



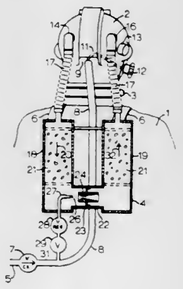
touch-and-close fasteners so that pad thickness and position is adjustable without changing pressure or resilience.

3,577,987
ARTICLE HAVING AN INTEGRAL ELONGATED APPENDAGE, AND METHOD OF MANUFACTURING THE SAME
Paul H. Bronnenkant, Williamsville, N.Y., assignor to Hallmark Plastics, Inc., Buffalo, N.Y.
Filed Nov. 6, 1967, Ser. No. 680,692
Int. Cl. A61f *5/46*
U.S. Cl. 128—130 **8 Claims**



An article is manufactured by molding of a polyolefin material a body portion from which extends an integral elongated appendage portion that is subsequently stretched to increase its length, reduce its cross-sectional area and increase its unit tensile strength.

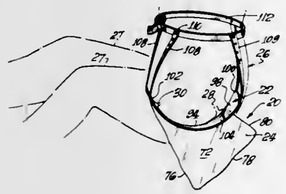
3,577,988
DUAL CANISTER RECIRCULATOR
Richard F. Jones, Santa Barbara, Calif., assignor to Agonic Engineering, Inc., Santa Barbara, Calif.
Filed Feb. 3, 1969, Ser. No. 871,986
Int. Cl. A62b *7/00, 18/04;* **B01d** *27/00*
U.S. Cl. 128—142.7 **5 Claims**



The gas mixture breathed by a diver is circulated through a carbon dioxide removing chemical to eliminate the build up of carbon dioxide in the life support atmosphere. The chemical is contained in two separate tanks or canisters carried by

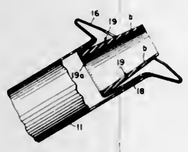
the diver, and a gas propulsion mechanism is disposed between the two canisters. This results in sucking atmosphere through one canister and pushing it through the other, which reduces the channelling of gas in the carbon dioxide absorber chemical. Also it isolates the sound of the gas moving mechanism so that very little noise reaches the diver's helmet, making it easier to use the diver's microphone and earphones. The carbon dioxide absorber is prepackaged in removable cartridges to improve the quality of the packing of the absorbing chemical and to make removal and replacement of the chemical quicker and easier.

3,577,989
DISPOSABLE PLASTIC, ELIMINATION-TRAPPING BAG FOR INCONTINENT PATIENTS
Jean O. Anderson, 169 S. Catalina St., Los Angeles, Calif.
Filed Oct. 31, 1968, Ser. No. 772,189
Int. Cl. A61f *5/44*
U.S. Cl. 128—283 **5 Claims**



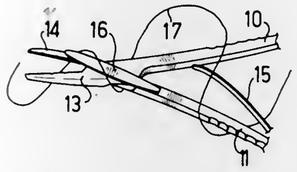
A disposable plastic elimination-trapping bag for incontinent patients or the like, including a sack having an open-top portion, and a thin resilient annular oval-shaped flange secured to the sack around the open-top portion to extend outwardly therefrom with the sack extending downwardly from the flange. The flange and the sack are sized to be attached to and positioned below the patient in the vicinity of the anus or in the vicinity of the anus extending to the vicinity of the urinary duct. The flange is shaped to conform to the contour of the patient. The sack may include a forward and a rearward edge one of which extends below the flange a greater distance than the other. The sack may be attached to the flange at acute angles to the axes of the flange.

3,577,990
URINARY APPLIANCE
Henry E. Borgerson, and Lewis K. Borgerson, 1926 Cambridge Ave., Flint, Mich. 48053
Filed Mar. 13, 1968, Ser. No. 712,669
Int. Cl. A61f *5/44*
U.S. Cl. 128—295 **8 Claims**



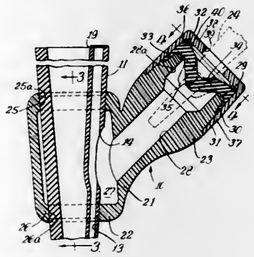
A urine-holding appliance for use by males comprising an elongate receptacle with a flange near one end which may be attached to the wearer's clothing, and a forwardly extending, elastic penis-fitting tube on the receptacle, having stops preventing undue telescoping of the tube into the receptacle.

3,577,991
SEWING TISSUE INSTRUMENTS OR THE LIKE
Guilbert Roland Wilkinson, 10 Arran Road, Hamilton, New Zealand
Filed Feb. 10, 1969, Ser. No. 797,971
Claims priority, application New Zealand, Nov. 12, 1968, 154,454
Int. Cl. A61b *17/04;* **B25b** *7/06*
U.S. Cl. 128—340 **1 Claim**



A forceps or like instrument having a covering shield attached to each member or leg at its pivoted end so as to cover any opening between engaging surfaces or projection at or about where each member or leg pivots, so that thread or the like employed with the forceps will be prevented from dropping into an opening between the surfaces or about the projections on the forceps.

3,577,992
VALVE FOR USE WITH A CONDUIT HAVING A LUMEN
Jack D. Merry, Minnetonka, Minn., and Fritz Deuschle, St. Louis, Mo., said Merry assignor to Brunswick Corporation
Filed Aug. 31, 1967, Ser. No. 664,716
Int. Cl. A61m *25/00*
U.S. Cl. 128—349 **7 Claims**

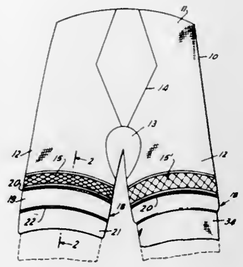


A valve adapter for use with a tubular conduit, such as an inflation-type catheter, having a lumen in the wall thereof. The adapter is arranged to receive the tapered end of a fluid flow duct, such as a hypodermic needle for conducting pumped air through the inflation lumen. The catheter is provided at its inner end with a balloon structure which is enlarged by the air pumped through the lumen to retain the catheter in a body cavity.

3,577,993
HOSE RETAINING PANTY GARMENT
Gerald W. Gluckin, Rye, and William Kurland, Sands Point, N.Y., assignors to William Gluckin & Co., Inc., New York, N.Y.
Filed Feb. 10, 1969, Ser. No. 798,099
Int. Cl. A41c *1/08*
U.S. Cl. 128—535 **21 Claims**

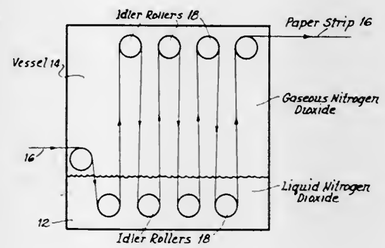
A hose-retaining panty garment comprising a panty with leg extensions having, at least at the lower extremities thereof, longitudinally and circumferentially yieldable portions, a first circumferential band of circumferentially yieldable material joined in foldable edge to edge relation to each yieldable portion, a second band of circumferentially yieldable material joined in foldable edge to edge relation to each of said first bands, said bands being of essentially the same

width, and said second band being adapted to be disposed in an upwardly folded juxtaposed position within said first band with a stocking edge extending upwardly between said assemblage and the leg of a wearer and downwardly between the juxtaposed bands, at least two of the four surfaces provided



by the juxtaposed bands and interposed stocking edge carrying a circumferential deposit of resilient friction material, and at least the second named inwardly disposed of said circumferential bands having means for stiffening the same in its transverse dimension without impairing its circumferential yieldability.

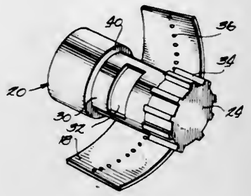
3,577,994
METHOD FOR PRODUCING SMOKING PRODUCT OF OXIDIZED CELLULOSIC MATERIAL
Howard F. Keller, Jr., Los Angeles, and Geoffrey R. Ward, Beverly Hills, Calif., assignors to Sutton Research Corporation, Los Angeles, Calif.
Filed Nov. 7, 1968, Ser. No. 774,064
Int. Cl. A24b *15/00;* **A24d** *1/18*
U.S. Cl. 131—2 **13 Claims**



The method for rapidly and uniformly effecting selective oxidation of cellulosic materials used in the preparation of a smokable product embodying the sequence of steps of soaking the cellulosic material with liquid nitrogen dioxide and then exposing the cellulosic material to hot gaseous nitrogen dioxide for oxidation reaction and wherein the liquid nitrogen dioxide may contain up to 8 percent by weight water.

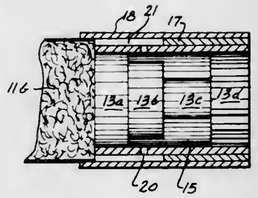
3,577,995
FILTER
Jackie L. White, Pfafftown, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Mar. 31, 1970, Ser. No. 24,081
Int. Cl. A24d *1/04;* **A24f** *1/08, 1/16*
U.S. Cl. 131—10.5 **10 Claims**

A tobacco smoke filter element comprising a solid smoke barrier having a smoke passageway extending between a forward end wall and a sidewall wherein the sidewall is covered with a thin smoke impermeable membrane provided with a plurality of orifices so that the smoke passing through the passageway must escape from the orifices. The several orifices direct the smoke radially from the membrane against an



impingement surface which may take the form of a smoke impervious sheet material supported by the barrier plug.

3,577,996
TOBACCO SMOKE FILTER
Joseph H. Sherrill, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed June 30, 1969, Ser. No. 837,669
Int. Cl. A24d *1/04;* **A24f** *1/08, 1/16*
U.S. Cl. 131—10.5 **10 Claims**

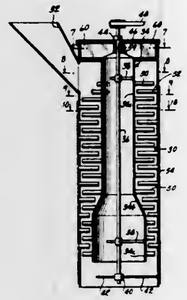


A filter is provided which is adapted to the affixed to one end of a tobacco rod. The filter is formed of three laminae defining a sleeve unit which is in sealing encompassing relation with a smoke barrier piece. The outer lamina is of smoke impervious thin sheet material, the intermediate lamina is of thin sheet material with a plurality of longitudinally extending elongated slots formed therein, and the inner lamina is of thin sheet material provided with a plurality of perforations arranged in sleeve-encircling relation and in registration with the slots of the intermediate lamina. As smoke is drawn through the filter, it is caused to pass through the perforations at a high velocity whereupon it impinges against an obstructing surface disposed in close proximity to the perforations.

3,577,997
TOBACCO TREATMENT WITH CITRIC ACID AND DEUTERIUM OXIDE
Max August Helmut Bindig, Munich, Germany, assignor to American Chemosol Corporation
Continuation-in-part of application Ser. No. 662,299, Aug. 22, 1967, now abandoned, Continuation-in-part of application Ser. No. 533,631, Mar. 11, 1966, now abandoned. This application Mar. 20, 1969, Ser. No. 809,004
Int. Cl. A24b *15/02*
U.S. Cl. 131—17 **12 Claims**

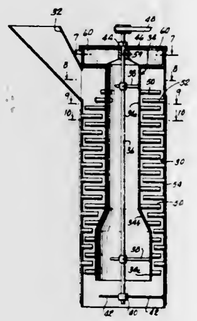
Treatment of tobacco to render smoking of the same safer. Reduction of the quantity of various undesirable constituents, particularly benzo(a)pyrene, in smoke resulting from the pyrolysis of such tobaccos in cigarettes and the like is shown as well as biological studies indicating such smoke condensates to be physiologically less dangerous. A mixture of citric acid and deuterium oxide is utilized to effect the foregoing modification of the combustion products of tobacco treated therewith.

3,577,998
IMPACT METHOD
Jesse R. Pinkham, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Continuation-in-part of application Ser. No. 529,424, Feb. 23, 1965, now abandoned, Division of Ser. No. 615,792, Feb. 13, 1967, abandoned. Filed June 23, 1969, Ser. No. 851,119
Int. Cl. A24c *5/36*
U.S. Cl. 131—96 9 Claims



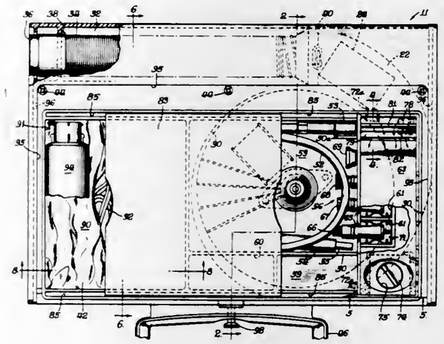
A method of striking an article, particularly a wrapper enclosed product such as a cigarette, by striking the article and achieving a clear impact without cutting the wrapper to create a blast of air upon impact so as to force the product out of the wrapper by an air pump action.

3,577,999
IMPACT APPARATUS AND METHOD
Jesse R. Pinkham, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Continuation of application Ser. No. 615,792, Feb. 13, 1967, now abandoned, which is a continuation-in-part of application Ser. No. 529,424, Feb. 23, 1965, now abandoned. This application July 14, 1969, Ser. No. 852,144
Int. Cl. A24c *5/36*
U.S. Cl. 131—96 4 Claims



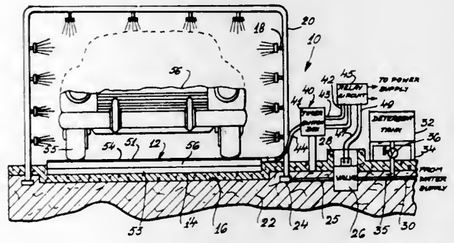
Apparatus for reclaiming tobacco from cigarette filters and wrappers includes a vertical casing with a top inlet and a bottom outlet. Vertically spaced and radially extending rods are secured to the inner periphery of the casing. A rotor with vertically spaced and radially extending rods secured thereto is rotatably mounted within the casing. The feed is struck as it passes downwardly between the intermeshing stationary and rotating rods and tobacco is disassociated from the filters and wrappers for subsequent separation by pneumatic or screen type separators.

3,578,000
COMBINATION MANICURING AND HAIR-DRYING APPLIANCE
Stanley V. Horecky, Oak Park, Ill., and Thomas Howe Hayes, Indianapolis, Ind., assignors to Sunbeam Corporation, Chicago, Ill.
Filed Jan. 29, 1968, Ser. No. 701,347
Int. Cl. A45d *29/18*
U.S. Cl. 132—79R 14 Claims



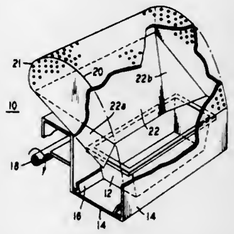
A compact, portable hair dryer and manicure appliance having a housing for a motor-driven blower unit with compartments provided for storing an air delivery hose, a collapsible hair-drying hat, and a manicure attachment including a flexible drive shaft and nail-treating implements. The housing is formed by three molded plastic parts which form the housing with its storage compartments and a closure for two of the compartments.

3,578,001
AUTOMATIC ELECTRO-PNEUMATIC CONTROL APPARATUS FOR CAR WASHING SYSTEM
Thomas J. Attaway, 50 S.E. 14th St., Dania, Fla.
Filed Aug. 29, 1969, Ser. No. 854,064
Int. Cl. B60s *3/04*
U.S. Cl. 134—45 10 Claims



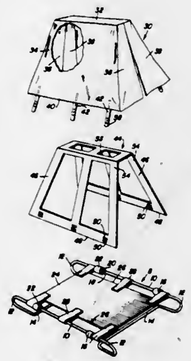
Apparatus for automatic control of a vehicle washing system includes a flexible pad wider than the bearing surface of a vehicle wheel. The pad containing gas or liquid is connected via a hose to a pneumatically or hydraulically operated timer switch. The pad is provided with means such as suction and or a weight to prevent displacement when a vehicle rolls over it. The timer switch automatically opens a circuit keeping an electrically controlled valve closed to stop discharge of a detergent solution on the vehicle.

3,578,002
APPARATUS AND METHOD FOR PROCESSING WORKPIECES
Henry A. Rowan, Watchung, and Donald H. Shiffner, Branchburg, N.J., assignors to Economics Laboratory, Inc., St. Paul, Minn.
Filed Sept. 25, 1969, Ser. No. 860,957
Int. Cl. B08b *3/06*
U.S. Cl. 134—25R 23 Claims



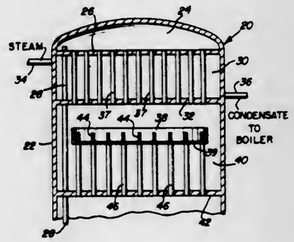
Apparatus for processing (e.g., cleaning, degreasing) workpieces which are supplied to the apparatus in containers or tote boxes includes a frame for removably engaging the tote box and means for continuously rotating the frame so that the workpieces are progressively and gently dumped into a perforated processing chamber and subsequently returned to the tote box. The processing chamber comprises a first inclined surface for receiving and spreading the dumped workpieces into a less confined area upon the partial rotation of the frame (whereupon the processing of parts may be commenced) and a second inclined surface for returning the processed workpieces to the tote box upon the further rotation of the frame. Methods for such processing, as well as carousel and conveyor systems incorporating such apparatus, are also disclosed.

3,578,003
PORTABLE PLATFORM AND SHELTER
Lucille G. Everett, 229 Pine, Dumas, Tex.
Filed Apr. 1, 1969, Ser. No. 812,151
Int. Cl. A45f *1/16, 1/12*
U.S. Cl. 135—4 3 Claims



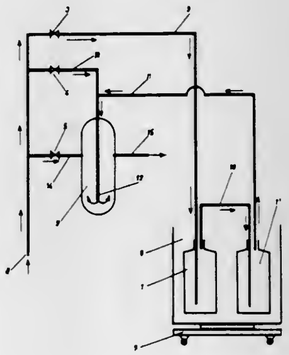
A portable platform and a compact tentlike shelter providing a safe, cozy, comforting and snug hiding place for a child. The platform is characterized by a low-lying rigid but lightweight frame suspending a canvas floor. Both ends of the tent embody readily openable and closable flaps having suitable flap-tying tapes which permit the child to crawl through, back and forth at will. The applicable and removable tent material is washable, is draped over a rigid shaped-imparting framework and the lower lengthwise edges are preferably provided with anchorable holddown straps. Thus and amply ventilated, this unique shelter permits concealment, prevents stuffiness and permits playful freedom for the child.

3,578,004
METHOD AND DEVICE FOR FLOW CONTROL OF LIQUOR BY VORTEX MOVEMENT OF THE LIQUOR
Le Roy A. Bromley, Moraga, and Stanley M. Read, Occidental, Calif., assignors to The Regents of the University of California
Continuation-in-part of application Ser. No. 534,012, Mar. 14, 1966, now abandoned. This application June 12, 1969, Ser. No. 832,710
Int. Cl. B01d *1/22*
U.S. Cl. 137—1 18 Claims



A method of controlling the flow of volatile liquor from a container in a manner to (1) maximize the ratio of liquor flow relative to vapor flow, (2) distribute the flow of liquor evenly to a series of parallelly disposed tubes although the inlets thereto are not in the same horizontal plane, (3) distribute the flow evenly against the interior walls of the tubes, and (4) accelerate the flow along the interior walls of the tubes to increase heat exchange with the environment about the tubes. The controller for carrying out the method includes a tubular element having (1) a portion provided with an inlet in the upper part thereof for the flow of fluid thereto. from the container, (2) a portion having a passage leading from the container downstream of the inlet and disposed for causing vortical movement to be imparted to the liquor entering the second mentioned portion through the passage, and (3) a throat downstream of the second mentioned portion.

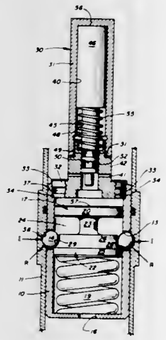
3,578,005
WATER TREATMENT APPARATUS
Roland Jurion, Bobigny, and Andre Leblanche, Saint-Denis, France, assignors to Societe D'Etudes Chimiques pour L'Industrie et L'Agriculture, Paris, France
Filed Mar. 1, 1968, Ser. No. 709,748
Claims priority, application France, Mar. 1, 1967, 96908
Int. Cl. G05d *11/00*
U.S. Cl. 137—3 11 Claims



A water treatment apparatus having a fluid mixing device for injecting an aqueous solution of a treating fluid into the

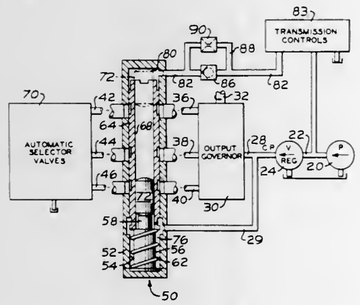
water to be treated. Storage vessels for the treating fluid communicate with a dilution vessel for dilution of the treating fluid. Dilution water is transmitted to the device through valved lines communicating in parallel with the storage vessel and with the dilution vessel. A control is provided to alternately direct dilution water through the storage vessel to the dilution vessel or directly to the dilution vessel as determined by the chemical makeup of the water to be treated.

3,578,006
ACCELERATION AND PRESSURE RESPONSIVE FLUID VALVE
Andrew J. Betz, Jr., Adelphi, Md.
Filed Apr. 25, 1969, Ser. No. 819,286
Int. Cl. F16k *17/36*
U.S. Cl. 137—38 **10 Claims**



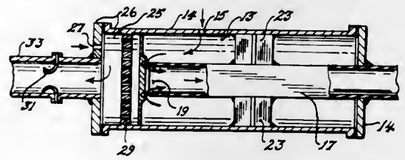
An acceleration and pressure responsive fluid valve for a conduit having a fluid blocking body held in place in the conduit by ball detents. The balls are held in locking position by a spring loaded piston which under high fluid pressure, moves against the spring out of ball locking position to allow the balls to pop into the body out of locking position which frees the body to be pushed out of blocking position in the conduit. The fluid which operates the piston enters the body through fluid spiracles which are closed during acceleration by an inertia operated valve, but opened again by a biasing spring when the acceleration decreases below a given value, thereby permitting fluid to flow through the spiracles to operate the piston and unlock the valve.

3,578,007
DELAYED GOVERNOR CUTOFF VALVE
William W. Blake, Wyoming, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 10, 1969, Ser. No. 883,839
Int. Cl. G05d *13/66*
U.S. Cl. 137—51 **3 Claims**



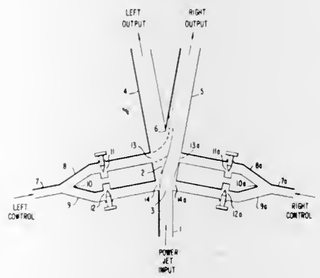
A delayed governor cutoff valve system is provided in a transmission control system for temporarily blocking hydraulic pressure signals which are normally transmitted from a governor to a group of automatic transmission shift selector valves. By blocking off the governor from the automatic shift selector valves the governor is prevented from sending erroneous pressure signals to the selector valves during certain phases of the transmission shifting cycle.

3,578,008
FAST OPENING PLATE VALVE SHOCK TUBE SYSTEM
Robert O. Clark, Albuquerque, N. Mex.
Filed Jan. 24, 1969, Ser. No. 793,760
Int. Cl. F16k *31/12;* **G01n** *3/02*
U.S. Cl. 137—68 **1 Claim**



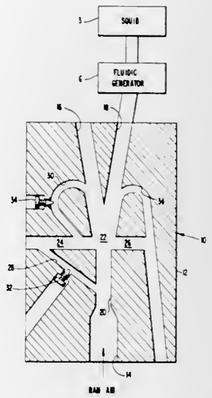
A thin aluminum plate is positioned over one end of a shock tube to seal the passage between high and low pressure regions. Upon sudden reduction of the pressure on one side of the plate, a low pressure rarefaction passes toward the plate causing the plate to move rapidly away from the shock tube opening and allow high pressure gas to enter the tube and form a chock wave therein.

3,578,009
DISTRIBUTED CONTROL FLUERIC AMPLIFIER
Chris E. Spyropoulos, Washington, D.C.
Filed Oct. 24, 1968, Ser. No. 770,184
Int. Cl. F15c *1/08, 1/14*
U.S. Cl. 137—81.5 **4 Claims**



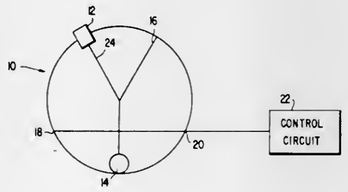
A flueric amplifier with two control ports for each control channel. Each control channel is split to operate both ports. The control flow is split and applied to the power jet through the two separate control ports. This separate application is called distributed control and results in greater flow recovery and pressure recovery as well as improved switching time. One of the control ports comprises an entrainment control port for introducing positive pressure control fluid to the attachment bubble existing along the attachment wall, and the other one of the control ports constitutes a momentum exchange control port for creating a momentum impact force on the power stream.

3,578,010
FLUERIC VELOCITY DISCRIMINATOR
Carl J. Campagnuolo, and Fernando Villarroel, Chevy Chase, Md.
Filed Dec. 19, 1968, Ser. No. 785,152
Int. Cl. F15c *1/04*
U.S. Cl. 137—81.5 **3 Claims**



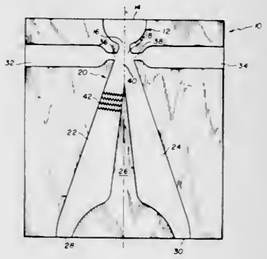
The discriminator includes a housing having an inlet passage and a pair of outlet passages opposite the inlet passage, the inlet passage having a reduced diameter passageway for creating a high velocity fluid stream. A pair of lateral passages communicate with the junction of the inlet and outlet passages and a bias passage communicates between the inlet passage and one of the lateral passages to create a low-pressure condition on one side of the fluid stream and thereby direct it through one of the outlet passages. A feedback passage communicates between the one outlet passage and the one lateral passage and deflects the fluid stream from the one outlet to the other outlet passage in response to a predetermined minimum pressure. A flow maintaining passage communicates with the other outlet passage and the other lateral passage to create a low-pressure condition on the other side of the fluid stream and thereby maintains fluid communication between the inlet and other outlet passages.

3,578,011
PYRO FLUIDIC RELAY
Allen B. Holmes, Rockville, Md., assignor to the United States of America as represented by the Secretary of the Army
Int. Cl. F15c *1/08, 4/00*
U.S. Cl. 137—81.5 **8 Claims**



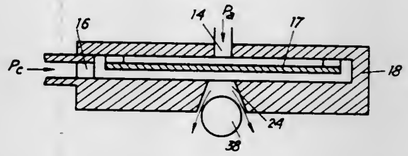
A pyro fluidic relay device which is capable of generating thermal energy at a predetermined time. A pure supersonic fluid amplifier is initially in an inactive mode of operation whereby the supply flow is discharged to atmosphere. At the predetermined time a control pressure is used to switch the fluid amplifier to an active mode of operation causing a resonator tube in an output channel thereof to generate thermal energy. In one application, the thermal energy so generated may be applied to a primer for detonating an explosive.

3,578,012
FLUERIC DEVICE
Cheng-Kuo Weng, Fair Lawn, N.J., assignor to Singer-General Precision, Inc., Little Falls, N.J.
Filed Apr. 2, 1969, Ser. No. 812,730
Int. Cl. F15c *1/04*
U.S. Cl. 137—81.5 **4 Claims**



A flueric device comprising a deflection chamber having at least two outlet receivers and a supply nozzle adapted to introduce supersonic fluid flow into said deflection chamber. Control means are provided to selectively deflect the fluid flow in the chamber between the two outlet receivers.

3,578,013
VORTICES, PARTICULARLY TO THEIR OUTLET
Guy Brochard, Asnieres, France, assignor to Societe Anonyme D.B.A.
Filed May 2, 1969, Ser. No. 821,312
Claims priority, application France, May 8, 1968, 150.983
Int. Cl. F15c *1/16, 3/06*
U.S. Cl. 137—81.5 **18 Claims**

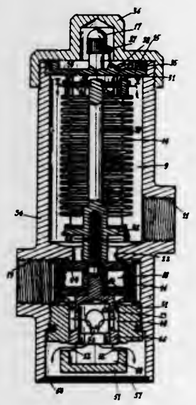


A fluid vortex includes: a cylindrical chamber; a first inlet for the main fluid into the chamber; a control inlet for the tangential introduction of a control fluid into the chamber in order to impart to the main fluid travelling inside the chamber a rotary motion; and an axial outlet for the fluid escaping from the chamber. According to the present invention, a body having substantially a revolution shape and without any rigid mechanical connection with the vortex is placed in the vortex outlet as a load therefor.

3,578,014
PRESSURE REGULATOR FOR PRESSURIZED-FLUID CIRCUITS
Jean Gachot, 179 Avenue de la Division Leclerc, Enghien, (Val d'Oise), France
Filed May 1, 1969, Ser. No. 821,006
Claims priority, application France, May 9, 1968, Nov. 28, 1968, 151,139;175,674
Int. Cl. G05d *16/06*
U.S. Cl. 137—115 **9 Claims**

Regulator for a pressurized-fluid circuit supplied by a pressure-elevating apparatus such as a compressor, said regulator

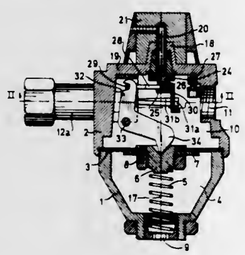
comprising a measuring chamber which communicates with the fluid circuit and is provided with a pressure-gauge element for measuring the pressure within said fluid circuit, and a regulating chamber which is connected to the pressure-elevating apparatus and has an orifice for the admission of the fluid in the direction of the measuring chamber, a low-pressure discharge orifice and means actuated by the pressure-gauge element in order to shut off the discharge orifice when the pressure of the reservoir is lower than a minimum value and to open said orifice when the pressure of the reservoir is higher than a maximum value. The admission orifice and discharge orifice are located in oppositely-facing relation



and the regulating chamber comprises a two-position obturator which is connected directly to the pressure-gauge element and selectively closes the admission orifice or the discharge orifice according as the pressure within the fluid circuit attains either the maximum or minimum value.

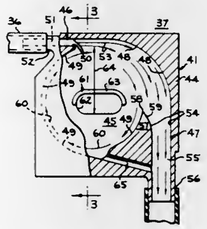
According to a preferred embodiment, the discharge orifice of the regulating chamber opens into a reaction chamber having an orifice which provides a communication with the atmosphere, means being additionally provided for producing a timelag between connection of said reaction chamber to the atmosphere and opening of the discharge orifice of the regulating chamber.

3,578,015
AUTOMATIC CHANGE-OVER REGULATOR FOR BOTTLED GAS SYSTEMS WITH TWO GAS CONTAINERS
Frede Reinholdt Andersen, Niverod, Denmark, assignor to Teknova A/S, Nivaa, Denmark
Continuation of application Ser. No. 560,502, June 27, 1966, now abandoned. This application June 3, 1969, Ser. No. 833,868
Int. Cl. G05d *11/00*
U.S. Cl. 137—113 **11 Claims**



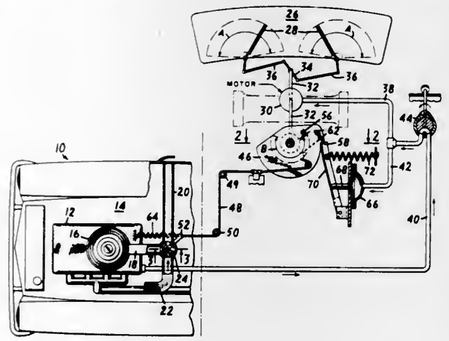
An automatic changeover regulator for selecting which of two gaseous fluid sources will supply a gas-consuming apparatus. The regulator has a casing with two inlets each of which has an associated valve controlled by a discharge fluid pressure responsive means and a switchover device including manual means operable to select one source as the service source, the other source being in reserve, and which, in either position, is automatically operable by the valve controlling means to indicate whether gas is actually being admitted from the service or reserve source.

3,578,016
ANTISIPHON FLUID INLET MEANS
Gerald J. Kushner, Louisville, Ky., assignor to General Electric Company
Filed Dec. 26, 1968, Ser. No. 787,045
Int. Cl. F16l *55/06;* **E03c** *1/10*
U.S. Cl. 137—216 **10 Claims**



An antisiphon fluid inlet means is provided to minimize the possibility of reverse flow of washing liquid from an automatic washer into the water piping of the building in which the washer is installed. The means comprises a housing defining an arcuate chamber therein having a tangential inlet and a tangential outlet thereto, and a vent to the atmosphere formed centrally within the housing. A flow direction means, which, in one embodiment includes a cusp formed adjacent the outlet opening from the chamber, directs a substantial portion of the fluid circulating within the chamber to the outlet opening, and directs the remainder of the fluid into the chamber for continued circulation therein. The vent is positioned out of the path of fluid circulating within the chamber and is adapted to admit air from the exterior of the housing should a suction force be exerted on the inlet, and to drain to the exterior of the housing a sufficient amount of any fluid which may backflow through the outlet to prevent fluid discharge from the chamber back through the inlet and into the water supply connected thereto.

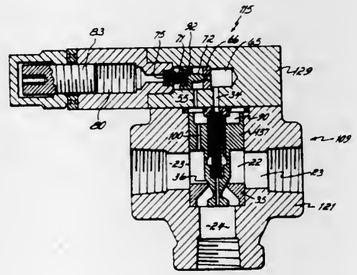
3,578,017
AUTOMATIC ACTUATION OF AIR CLEANER SELECTOR VALVE
Harry B. Rath, Allentown, Pa., assignor to Mack Trucks, Inc., Allentown, Pa.
Filed Nov. 26, 1968, Ser. No. 779,194
Int. Cl. F16k *31/46, 31/52*
U.S. Cl. 137—344 **10 Claims**



A preferred embodiment of this invention comprises a cam rotatably carried by the drive shaft of a motor that operates

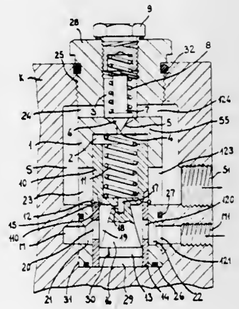
the windshield wipers of a vehicle. The cam carries one end of a cable, which is connected to an extension of an air cleaner selector valve that is normally held in a position allowing the passage of air from outside by a spring connected thereto. As the shaft oscillates, the cam is rotated and tensions the cable to move the selector valve to a position allowing the passage of air from under the hood. In order to hold the valve in this latter position, a lever operated by the motor engages a shoulder on the cam and holds it in place until the motor is turned off.

3,578,018
RATE OF PRESSURE RISE LIMITING VALVE
Leo H. Dillon, Columbus, Ohio, and William F. Weese, Lawndale, Calif., assignors to Abex Corporation, New York, N.Y.
Filed Apr. 18, 1969, Ser. No. 817,447
Int. Cl. F16k *17/10*
U.S. Cl. 137—489 **23 Claims**



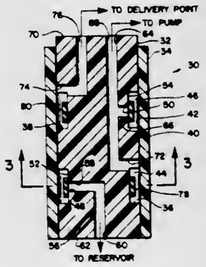
A valve for preventing pressures in a fluid line from exceeding a preset value by venting fluid to a reservoir whenever the rate of pressure increase in the line exceeds some predetermined value or rate of gain. The valve is operative to open and spill fluid to relieve the increasing pressure condition whenever it detects an excessive rate of pressure increase, irrespective of the pressure at which the increase is initiated.

3,578,019
RELIEF VALVE UNIT FOR HYDRAULIC PRESSURE LINES
Marco Turolla, 213, Via Toscana, Bologna, Italy
Filed Dec. 24, 1968, Ser. No. 786,606
Claims priority, application Italy, Jan. 4, 1968, 6704A/68
Int. Cl. F16k *17/10*
U.S. Cl. 137—491 **5 Claims**



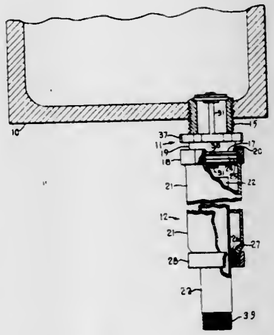
A differential-piston relief valve provided with a shock- and vibration-absorbing plunger and a spring-urged pilot vent valve for operating the relief valve are mounted in a single cylindrical hollow body in which the cylinders for the relief valve and attached plunged and the housing for the vent valve are bored. The hollow body is closed at one end by a screw plug, acting also as vent valve spring-adjusting means, and with external screw threads for mounting the whole as a unit in a blind bore of a block forming a part of the hydraulic pressure line. The hollow body is provided with inlet- and outlet ports which come to be in front of corresponding ports opening within the blind bore of said block, thus completing the hydraulic circuit.

3,578,020
VALVE ASSEMBLY
Jerry E. Rochte, Seal Beach, and Larry S. McDavid, Fullerton, Calif., assignors to Beckman Instruments, Inc.
Filed Aug. 20, 1968, Ser. No. 754,012
Int. Cl. F16k *15/14*
U.S. Cl. 137—512 **3 Claims**



A check-type valve assembly in which an annular channel is formed in a valve body. A port is formed in the inner surface of the channel and is closed by an elastic band which is positioned under tension in the channel so as to bear tightly against the inner surface thereof. The elastic band functions as a valve element for controlling the flow of fluid through passages communicating with said port and the annular channel.

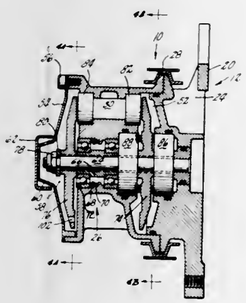
3,578,021
FROST HEAVE-RESISTANT PUMP INLET ASSEMBLY
August Milo, 1015 Schliefer Drive, Hillside, N.J.
Filed Dec. 23, 1969, Ser. No. 887,524
Int. Cl. F16l *27/12*
U.S. Cl. 137—515 **3 Claims**



A frost heave-resistant inlet assembly for a pump designed for pumping inflammable liquid, and disposable above the ground, and connectable to a tank outlet disposed underground, consists in a sleeve, the lower portion of which is connected in sealed sliding relation to the tank outlet. The sleeve is extendable over the tank outlet for a distance adequate to accommodate the tank outlet in the event of a

frost heave causing the outlet to rise above the ground. A coupling is connected over the upper portion of the sleeve in outside sealable relation, and it has an inwardly projecting circumferential lip having a bevel on its lower portion. A valve section, having a lower nipple portion and an upper portion, and having a seating means on its upper portion, has a valve mounted therein, the valve being seatable on the seating means when the pump is idle, and being in raised position when the pump is running. The nipple portion of this valve section has a circumferential groove and a broken ring is seated in the groove and projecting out of it so as to serve as locking means for the beveled edge of the coupling. A connecting means, such as a coupling, is mounted on the upper portion of the valve section to connect it in outside sealing relation with the pump inlet.

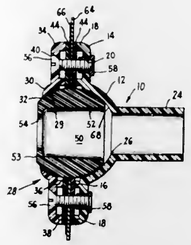
3,578,022
DIRECTIONAL CONTROL VALVE
George W. Jahrstorfer, Wapping, Conn., assignor to Chandler Evans, Inc., West Hartford, Conn.
Filed Dec. 8, 1969, Ser. No. 883,154
Int. Cl. F16k *11/02, 11/10*
U.S. Cl. 137—596 **6 Claims**



A directional control valve has a supply pressure chamber in communication with a source of pressurized air and a vent pressure chamber in communication with the surrounding environment. Three ducts in respective communication with three ports, each interconnect the supply pressure chamber and the vent pressure chamber. Two rotors, each including two arcuate cuts, are fixedly secured to a rotatable shaft which extends between the chambers. Positioned within the ends of the ducts are spring-loaded carbon seals which are adapted to sealingly engage the inboard faces of the rotors. The cuts in the rotors are arranged so that the ports are pressurized and vented in a predetermined sequence as the shaft is rotated.

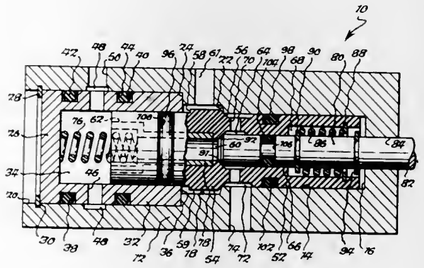
3,578,023
WALL-MOUNTED PIVOTABLE FLOW-DIRECTING ASSEMBLY
Joseph Diemond, Simsbury; Melvin Y. Gershman, West Hartford, Conn., and Fred A. Ravreby, Framingham, Mass., assignors to Coleco Industries, Inc., Hartford, Conn.
Filed Apr. 10, 1969, Ser. No. 815,034
Int. Cl. E04h *3/16*
U.S. Cl. 137—592 **9 Claims**

An assembly adapted for mounting on a wall of a pool or the like for directing the flow of water thereinto includes a socket portion defining a generally spherical chamber and a generally spherical flow-directing member seated therein. The flow-directing member has an axial passageway and is pivotable in the chamber to position the passageway between the inlet and outlet openings of the chamber in a multiplicity of angular attitudes to control the direction of flow. A resilient gasket in the chamber has a circular aperture therein



which is configured and dimensioned to snugly seat the flow-directing member to restrain movement thereof and form a seal therewith.

3,578,024
SUPPLY AND EXHAUST CONTROL VALVE
Jennings Paul Hill, 9861 Memphis Ave., Apt. 9A6, Cleveland, Ohio 44144
Filed Oct. 31, 1968, Ser. No. 776,850
Int. Cl. F16k *11/10*
U.S. Cl. 137—627.5 **10 Claims**

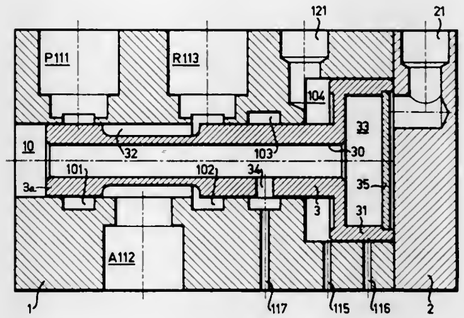


A fluid control valve of the supply and exhaust type including a slidable valve cartridge having a valve face normally sealing access of fluid to a work port and having an interior passage providing communication from said work port to exhaust normally sealed by a valve face on a plunger slidably movable within said cartridge, said plunger being movable against spring resistance to open said communication to exhaust or to allow fluid flow to said work port and sealing means to prevent leakage.

3,578,025
FLUID-CONTROLLED, IN PARTICULAR HYDRAULICALLY OR PNEUMATICALLY CONTROLLABLE SLIDE VALVE ARRANGEMENT
Eduard Furrer, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland
Filed Dec. 18, 1968, Ser. No. 784,678
Claims priority, application Switzerland, Dec. 22, 1967, 18131/67
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.66 **5 Claims**

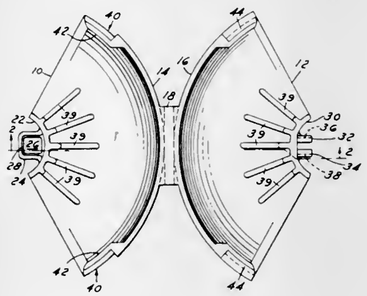
There is disclosed a fluid-controlled slide valve arrangement, in particular a pneumatically or hydraulically controlled slide valve arrangement, for alternately connecting an outflow conduit with a pressure conduit and return flow conduit of a fluid-operating system. This slide valve arrangement embodies a sleeve valve member displaceably mounted in a slide valve housing, such sleeve valve member incorporating at one end a piston extension of larger diameter. Fluid-

operated control means alternately apply a pneumatic or hydraulic overpressure to the end faces of the piston extension in order to displace the sleeve valve member. The pneumatic or hydraulic control overpressure is only maintained



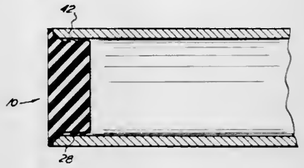
during a portion of the switching operation. Relief channel means provided at the slide valve arrangement communicate with the outside, whereby the control pressure drops during the latter part of the switching operation as soon as the relief channel means are freed by the enlarged piston extension.

3,578,026
JACKET FOR FLEXIBLE HOSE
Howard F. Meyer, Jr., Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Feb. 24, 1969, Ser. No. 801,397
Int. Cl. F16l *11/12, 57/00*
U.S. Cl. 138—110 **8 Claims**



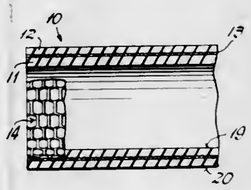
A hose jacket of acetal resin and designed to bend a flexible hose approximately 90° is formed in two partial semitoroidal sections joined together at the outer radius by a flexible hinge portion of the resin. The sections have an annular cavity conforming approximately to the size and shape of the hose. Folding the sections around the hose and latching the arcuate edges together at each end and the middle bends the hose sharply without kinking or damaging the hose walls. Forces exerted on the jacket by the hose assist in maintaining the latch elements in engagement with each other.

3,578,027
SEALING PLUGS OR CLOSURES
William L. Zopfi, 593 Pleasant, Ferndale, Mich.
Filed July 30, 1969, Ser. No. 846,148
Int. Cl. F16l *55/10*
U.S. Cl. 138—89 **1 Claim**



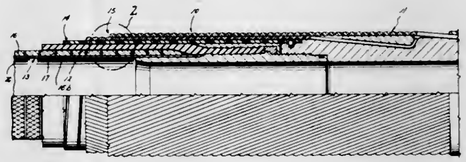
A molded rubberlike sealing plug or closure formed of a semihard rubberlike material for closing a pipe end or the like is formed with tapered ribs on its peripheral surface.

3,578,028
REINFORCED HOSE AND METHOD OF MAKING THE SAME
Robert E. Roberts, Wilton, Conn., assignor to Fred T. Roberts & Company, Wilton, Conn.
Filed July 16, 1969, Ser. No. 842,122
Int. Cl. F16l *11/08*
U.S. Cl. 138—123 **8 Claims**



A tubular flexible hose of elastomeric material and the method of making the same, said hose having a reinforcing layer of warp knit net fabric. It can have a helical spring wire under the fabric. The hose is highly resistant to bursting under internal pressure, and has substantially no axial extension and only slight radial stretch and can be readily manufactured.

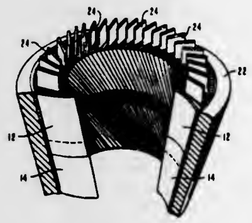
3,578,029
PIPE
Roy H. Cullen; Charles H. Elliott; Jimmie R. Aker, and Harvey O. Mohr, Houston, Tex., assignors to Youngstown Sheet and Tube Company, Youngstown, Ohio
Continuation-in-part of application Ser. No. 648,039, June 22, 1967, now abandoned , and a continuation-in-part of 712,163, Mar. 11, 1968, now Patent No. 3,499,668. This application June 27, 1969, Ser. No. 837,245
Int. Cl. F16l *11/16*
U.S. Cl. 138—133 **13 Claims**

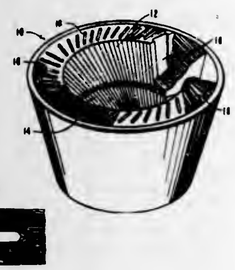


This invention discloses a flexible pipe suitable for use as a drill string. The construction of the pipe is such that it will

withstand high internal and external pressures, will sustain a substantial longitudinal load, and a substantial torque.

3,578,030
ABLATIVE AND INSULATIVE STRUCTURES
Donald M. Hatch, Harbor City, Calif., assignor to Hitco
Division of Ser. No. 450.076, Apr. 27, 1965, Pat. No. 3,449,189.
Filed Sept. 27, 1967, Ser. No. 679,281
Int. Cl. F16l *9/14*
U.S. Cl. 138—141 **11 Claims**





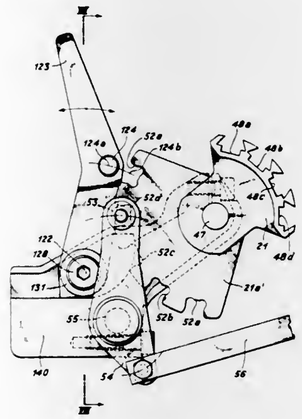
An ablative structure in the form of a relatively thick-walled body of revolution is prepared by laying up, substantially side-by-side successive panels of high temperature resistant materials impregnated with a thermally curable resin within a female mold, disposing between certain panels removable aperture-defining plugs out of communication with the interior and exterior surface of the body, curing the resin and densifying the structure under radially outwardly exerted pressure and removing the plugs from the structure.

3,578,031
HOOK-SHAPED GRIPPER POINT
Heinz Maassen, Dulken, Germany, assignor to The Firm of Jean Gusken, Dulken, Rhineland, Germany
Filed Sept. 29, 1969, Ser. No. 861,558
Claims priority, application Germany, Sept. 27, 1968, P 17 85 467.0
Int. Cl. D03d *47/20*
U.S. Cl. 139—122 **3 Claims**

A hook-shaped yarn takeup gripper point having a protuberance formed on a first side of the free leg of the hook, the end of the protuberance away from the tip of the gripper point forming a trailing edge which extends substantially perpendicular to a central plane passing through both the main leg and the free leg of the gripper point. A spring operated

flap in the main leg holds a yarn against the free leg, and hence against the said edge.

3,578,032
LOOM HAVING A JACQUARD MECHANISM AND A WEFT CHANGING MECHANISM
Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland
Filed Sept. 11, 1968, Ser. No. 758,976
Claims priority, application Switzerland, Sept. 15, 1967, 12952/67
Int. Cl. D03d *47/24*
U.S. Cl. 139—126 **2 Claims**

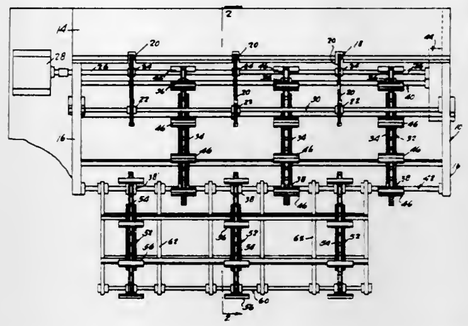


There is disclosed a loom including a weft change mechanism and a Jacquard mechanism for control of weft change as well as warp shedding. The weft change mechanism is coupled through resiliently yielding members to the Jacquard and is provided with a manually operable lever for locking that weft changing mechanism against weft changes called for by the advance of the Jacquard mechanism.

3,578,033
WOOD PULP AND CHIPPING CHAIN SAW APPARATUS
Gerald R. Wood, Cross City, Fla.
Filed Sept. 20, 1968, Ser. No. 761,165
Int. Cl. B27b *17/00*
U.S. Cl. 143—32 **5 Claims**

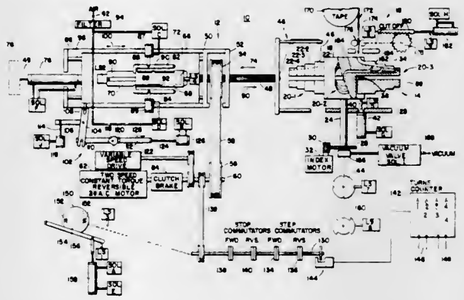
A wood pulp and chipping apparatus for cutting and chipping logs into pulpwood comprising a frame with a forward conveyor means and a rear conveyor means disposed to receive logs from said forward conveyor means, and said conveyor means being disposed at an inclined angle with respect to a horizontal plane so as to feed logs carried thereby

to a chipping and pulping means comprising an endless chain drive with cutter and chipping teeth thereon, which teeth are disposed in directions so as to cover the top of the endless



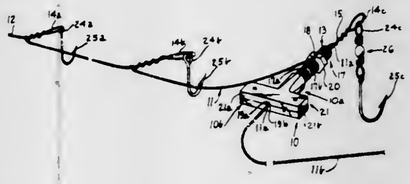
chain and the opposite sides thereof, and with the chipping and cutting means disposed to receive the logs after they have been fed rearwardly by said rear conveyor means.

3,578,034
APPARATUS FOR AUTOMATICALLY WINDING CONCENTRIC DYNAMOELECTRIC MACHINE COILS
Robert J. Eminger, Fort Wayne, Ind., assignor to Fort Wayne Tool & Die, Inc., Fort Wayne, Ind.
Filed Mar. 27, 1969, Ser. No. 811,016
Int. Cl. B21f *3/00*
U.S. Cl. 140—1 **20 Claims**



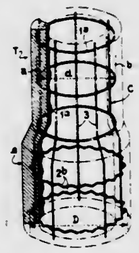
Apparatus for automatically winding a set of at least two concentric dynamoelectric machine coils upon a coil form having at least two progressively small steps. A flyer for winding wire on the coil form steps is rotatably supported by a block, and a two-speed electric motor is connected to rotate the flyer. A slide supports the block and flyer for longitudinal movement parallel with the axis of the flyer between forward and rear positions, and latches selectively retain the block and flyer at the forward and at least one intermediate position thereby to locate the flyer in winding relationship with each of the coil form steps. The slide with the block and flyer supported thereon is mounted for longitudinal movement thereby to traverse the flyer across the coil form steps. In one embodiment the slide is oscillated by the motor thereby to level-wind the wire on each of the coil form steps; and in another embodiment the slide is continuously moved from a forward to a rear position by a lead screw driven by the motor. A control circuit is provided which automatically actuates the motor to its low speed a predetermined number of turns in advance of completion of a given coil; and which upon completion of the coil actuates a latch to permit the block and flyer to move rearwardly by one incremental step when the flyer is in a predetermined rotational position with respect to the coil form, thereby to move the flyer into winding relationship with the next coil form step, and actuates the motor to its high speed to initiate winding of the next coil. The motor is preferably a multiphase, two-speed, constant torque induction motor, thus providing very rapid acceleration and deceleration between its high and low speeds, and the latches are preferably electromagnetically actuated from a source of substantially ripple-free direct current, thus providing nearly instantaneous stepping of the flyer, to the end that a set of concentric coils may be automatically wound at high speed without stopping the flyer and with the connections between adjacent coils accurately located.

3,578,035
SUCCESSIVE WIRE LOOP TWISTER
Orval Parker, 3719 Seminole St., Houston, Tex.
Filed Feb. 25, 1969, Ser. No. 802,051
Int. Cl. B21f *3/00, 1/06, 7/00*
U.S. Cl. 140—102.5 **8 Claims**



The disclosure is to a tool or device installable on a running length of wire at a distance from an end thereof and at the point installed adapted to be manipulated to twist the wire several times around itself leaving a bight or loop. The twister may then bend the running length of wire to extend substantially in initial direction; and then the tool device or twister can be deftly removed and reinstalled, further along upon the aforesaid running length, and a second series of twists made in the length, leaving a second loop, and on successively.

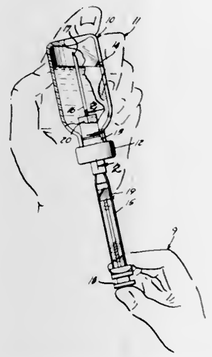
3,578,036
LATTICE FOR THE REINFORCEMENT OF TUBULAR CONCRETE ELEMENTS HAVING A SOCKET METHOD FOR PRODUCING SAID LATTICE AND THE PRODUCTS OBTAINED
Maurice Francois, Saint Dizier, France, assignor to Trefilunion, Paris, France
Filed Mar. 18, 1969, Ser. No. 808,252
Claims priority, application France, Mar. 22, 1968, 144,908
Int. Cl. B21f *27/22*
U.S. Cl. 140—107 **1 Claim**



Method for producing a reinforcement having a socket for a reinforced concrete tubular element having a socket. The method comprises forming a prereinforcement from lattice in which some of the warp wires have successive deformed nonrectilinear portions whereas the other warp wires and all the weft wires are rectilinear. The deformed warp wires are bent in the form of welded rings and the rest of the lattice is bent in the form of a cylinder. The part of the prereinforcement intended for the socket part of the tubular element is radially

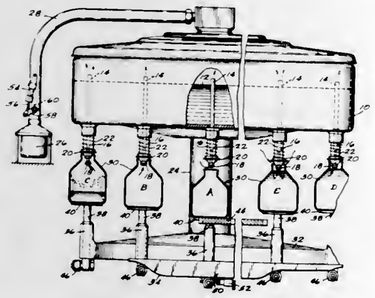
expanded to the desired diameter by at least partially straightening the deformation of the deformed warp wires.

3,578,037
METHOD FOR FILLING A SYRINGE
Thomas J. Flynn, 112 White Cap Ave., Daytona Beach, Fla.
Filed Sept. 11, 1969, Ser. No. 857,089
Int. Cl. B65b *1/04, 3/04;* **B67c** *3/00*
U.S. Cl. 141—2 **4 Claims**



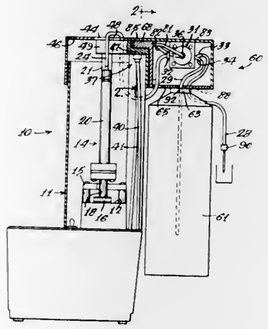
An apparatus and method for preventing foreign material from entering syringes during the filling of the syringes from containers and thus preventing foreign material from being injected into a patient. The apparatus provides a liquid container, such as a vial, having a pierceable self-sealing stopper for inserting the syringe needle for filling the syringe. A filter material is attached to the top of the container so that the needle can be extended therethrough and adapted to filter out foreign material such as coring that breaks loose as the needle pierces the top of the container. A method is provided including drawing air into a syringe prior to inserting the syringe cannula through a pierceable self-sealing stopper of a container. The air in the syringe is then injected into the container freeing any coring material that has broken from the container stopper either into the filtering material or into the liquid in the container. The cannula tip is then withdrawn or extended to place the tip either in the liquid or the filter material where the coring material has not been deposited and drawing the required amount of liquid from the container into the syringe.

3,578,038
RECEPTACLE FILLING METHOD
Chester O. Burford, King of Prussia, Pa., assignor to Federal Mfg. Co., Milwaukee, Wis.
Filed Sept. 15, 1967, Ser. No. 668,091
Int. Cl. B65b *3/18*
U.S. Cl. 141—7 **9 Claims**



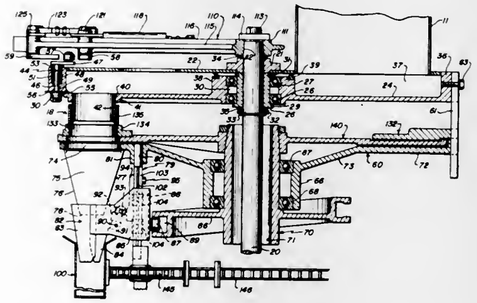
A rotary type filling machine having a plurality of filling heads spaced about is periphery. The filling heads have vent tubes for communicating the interior of flexible walled containers, which are to be filled by the machine, with a gas storage area within the machine. This area is subjected to a pulsing vacuum which vacuum is communicated to the containers via the vent tubes and which operates on said containers to prevent overfilling of the same.

3,578,039
AUTOMATIC PROPORTIONER ASSEMBLY
Edward P. Marbach, Los Angeles, Calif., assignor to Baxter Laboratories, Inc.
Filed Oct. 15, 1968, Ser. No. 767,676
Int. Cl. B65b *1/04, 3/04*
U.S. Cl. 141—18 **9 Claims**



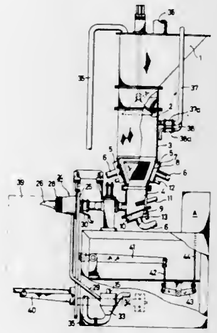
An automatic proportioner for proportioning a sample and a diluent for subsequent chemical analysis including a syringe driven by an actuator and controlled by a control system, a valve for selectively connecting the syringe to either a source of diluent in a receptacle or a source of sample, with diluent receptacle and valve being formed in a unitary assembly selectively removable from the main housing supporting the syringe and the control system components so that the receptacle, valve and syringe may be removed easily and replaced by another set.

3,578,040
CARTON FILLER
J. Robert Galloway, 908 Georgian Drive, Danville, Ill.
Filed Dec. 20, 1968, Ser. No. 785,531
Int. Cl. B65b *57/02*
U.S. Cl. 141—142 **10 Claims**



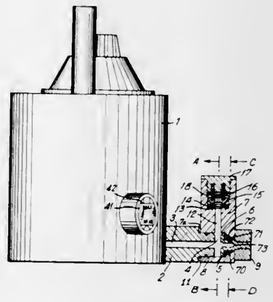
A filler for use with a carton filling machine having an improved no carton-no fill mechanism arranged such that the capacity of the volumetric filling mechanism thereof can be changed without making a number of additional adjustments. Also, the hopper and the cup support for the filler is adapted to be vibrated, to provide improved carton fill.

3,578,041
AUTOMATIC APPARATUS FOR PACKAGING POWDERED MATERIAL WITH UNIFORM BAG WEIGHT AND WITH DUST-FREE OPERATION
Katsuji Obara, Yokohama, Kanagawa, Japan, assignor to Nippon Jido Fukurozumeki Mfg. Co., Ltd., Tokyo, Japan
Filed Sept. 23, 1968, Ser. No. 761,441
Int. Cl. B65b *1/18, 1/34*
U.S. Cl. 141—59 **9 Claims**



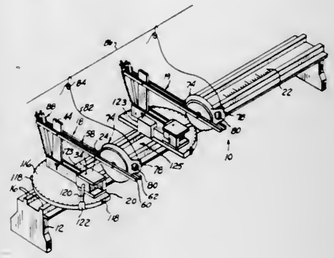
An automatic packaging apparatus for powdered material in which such material is fluidized in an air chamber and delivered by air to a filling means associated with a receiving bag. Flow control means are provided responsive to automatic weighing means, and recirculation means are provided for returning the dust from the air chamber and the region of the filling means for recirculation.

3,578,042
VAPORIZER FOR ANESTHETIC
Hans Georg Breiling, Lubeck, Germany, assignor to Dragerwerke, Heinr. & Bernh. Drager, Lubeck, Germany
Filed Dec. 24, 1968, Ser. No. 786,621
Claims priority, application Germany, Jan. 2, 1968, P 16 16 191.4
U.S. Cl. 141—301 **5 Claims**



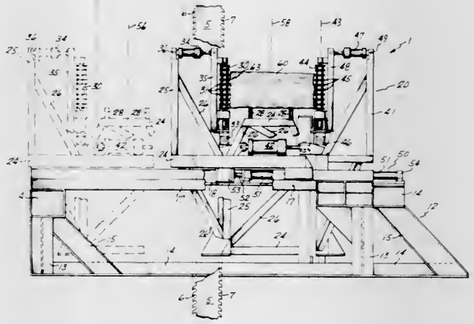
Narcosis apparatus comprising a vaporizer equipped with a filler assembly consisting essentially of a horizontal member and a member rotatable thereon to a filling position and is provided with bore holes that align themselves only when in filling position, the exterior opening of the bore holes when aligned being at the same level as the preselected maximum liquid level within the vaporizer so that the latter will automatically be prevented from overfilling.

3,578,043
LUMBER CUTTING APPARATUS
Donald C. Menge, Warren, Mich., assignor to Troy Steel Corporation, Troy, Mich.
Filed Aug. 15, 1968, Ser. No. 752,918
Int. Cl. B27b *5/20*
U.S. Cl. 143—6 **24 Claims**



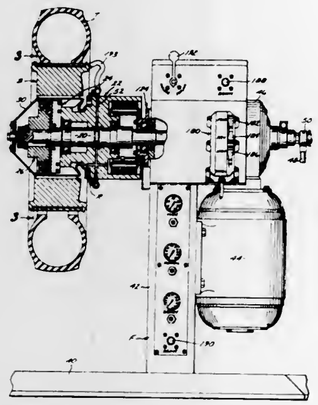
A rotatably adjustable pedestal support to which is mounted a circular saw for horizontal movement back and forth along a straight line across a piece of lumber and for rotation about a vertical axis to a desired cutting pitch. In a further embodiment a pair of rotatably adjustable pedestal supports are mounted on a longitudinal table slide for adjustment toward and away from each other between selected positions accommodating the finished length of a wooden stud or truss element.

3,578,044
CARRIAGE FOR SAWING SHAKE BOLTS INTO WEDGES
Norman E. Norlander, Longview, and Robert A. Knowles, Tacoma, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.
Filed Feb. 26, 1969, Ser. No. 802,609
Int. Cl. B27b *13/00;* **B27m** *3/02*
U.S. Cl. 143—12 **2 Claims**



A shake bolt is supported on a carriage for movement relative to a cutting saw. The carriage has grasping rollers which engage the ends of the bolt and feed it into the plane of the saw. Each roller is driven by a stepped drive to provide alternate larger and smaller rotation step movements for the rollers on opposite ends of the bolt. While the roller at the first end rotates the larger rotation step, feeding the first end of the bolt a greater distance beyond the saw plane to produce a butt cut, the roller at the other end rotates a smaller rotation step, feeding the other end a lesser distance beyond the saw plane, to produce a tip cut. This cycle alternates with a second cycle wherein the roller at the first end rotates the smaller rotation step for a tip cut while the other roller rotates the larger step for a butt cut. The system for aligning the grasping rollers with the end surfaces of the bolts and the two-step drive system are disclosed in detail.

3,578,045
EXPANDING TIRE-SUPPORTING WHEEL APPARATUS
John B. Lundberg; Richard J. Beck, and James N. Locke, Lodi, Calif., assignors to Super Mold Corporation, Lodi, Calif.
Filed May 26, 1969, Ser. No. 827,692
Int. Cl. B60c *25/00*
U.S. Cl. 144—288 **7 Claims**

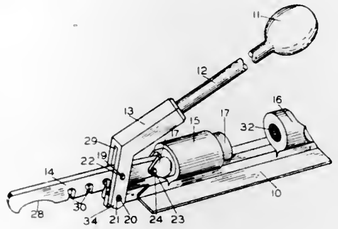


An expanding wheel apparatus for temporarily supporting a pneumatic tire during operations such as buffing, grinding, smoothing and dressing preparatory to recapping or retreading the tire. The apparatus includes a rotatable shaft to which is keyed a scroll wheel. A jaw support is rotatably supported by the shaft, with a plurality of jaws being carried by such jaw support for radial movement relative thereto. Engaged helically extending teeth are carried by the jaws and the scroll wheel. When the jaw support is locked in place, the rotation of the scroll wheel will extend or retract the jaws. The jaws support a radially expandable band assembly that receives the tire when such assembly is in a contracted position. The wheel assembly is radially expanded when the jaws undergo radial movement relative to the scroll wheel.

3,578,046
TOOL
Joseph W. Curran, 22 St. Mary's Place, Denville, N.J.
Filed Dec. 20, 1968, Ser. No. 785,528
Int. Cl. B25b *15/00*
U.S. Cl. 145—50 **4 Claims**

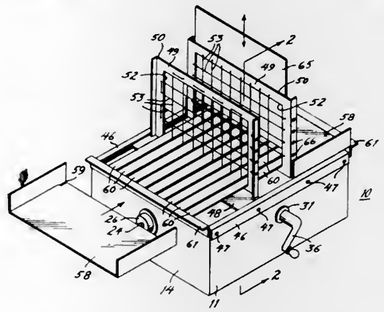
A bifurcated screwdriver for torquing a threaded fastener having a drive slot interrupted by a borehole. The tines for torquing the fastener have a first pair of linear thrust surfaces and a second pair of nonlinear thrust surfaces along the termination thereof, together with two pair of torquing surfaces adjacent thereto. In addition, the tines have axially-extending, arcuate surfaces for position-orienting the tool relative to the borehole upon the borehole having an element in penetration thereof. The tool has a hexagonal shank for engagement with a mechanically-advantaged torquing source.

3,578,047
RECIPROCATING NUT SHELLER
Bernard W. Diggs, 571B Meadowlark Drive, Little Rock, Ark.
Filed Mar. 13, 1969, Ser. No. 806,792
Int. Cl. A23n *5/02*
U.S. Cl. 146—16 **1 Claim**



A swingably movable handle, functioning as a second order lever, is connected to actuate the reciprocable jaw of a piston-type nut sheller through a swingably movable connecting rod releasably latched to the handle. The connection is selectively effected by the seating of a latch pin mounted on the handle into one of a plurality of linearly spaced notches disposed along the underside of the connecting rod, to thereby alter the position of the reciprocable path of the movable jaw as may be required to shell nuts differing in size, the continued connection of the handle to the connecting rod as the handle is swung in either direction being assured by a distinctive configuration of the notches.

3,578,048
POTATO DICER
Harrison M. Von Duyke, P.O. Box 842, Wilmington, Del.
Filed June 3, 1969, Ser. No. 830,000
Int. Cl. B26d *1/06, 3/20*
U.S. Cl. 146—78 **8 Claims**

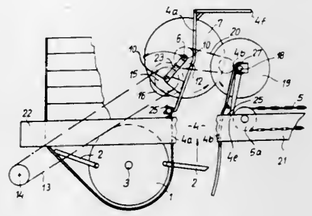


Apparatus for dicing cooked potatoes which includes a base, support members for supporting the potatoes, tracks on the base carrying a pair of opposed cutting frames, which frames have metallic cutting wires thereon, and a drive connecting the frames to provide horizontal motion to the frames to cut the potatoes into strips so that they can be further diced by a vertically movable blade.

3,578,049
MEANS FOR COMMINUTING STALK OR LEAF VEGETABLE
Ernst Weichel, Bahnhofstr.1, Heiningen, Kreis, Goppingen, Germany
Filed Feb. 26, 1968, Ser. No. 708,244
Int. Cl. A01d *55/00;* **B02c** *18/06*
U.S. Cl. 146—98 **19 Claims**

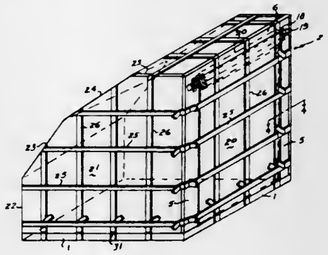
A comminuting arrangement for the cutting or crushing of stalk or leaf vegetables has a conveyor and a conveyor chute

forming the discharge of the conveyor and comprising walls in the zone of a cutting device. The cutting device comprises at least two groups of cutting discs, and the discs of each group are arranged on a respective common shaft. The shafts carrying the cutting discs are mounted exteriorly of the conveying chute and rotate at a low speed. The distance between



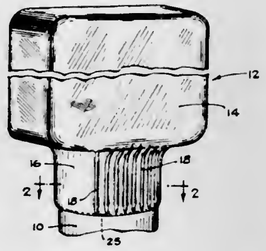
the two shafts arranged in opposition to each other is less than the sum of the radii of the opposed cutting discs, and the cutting discs extend through opposite walls of the chute and only partially into the chute. The device is arranged for mounting on a self-loading vehicle or for stationary operation.

3,578,050
COLLAPSIBLE AIRCARGO CONTAINER
Joseph L. Weingarten (1927 Oak Tree Drive, East Kettering, Ohio 45440), and Stephen R. Mehaffie, Dayton, Ohio (1596 Beaver Ridge Road, Kettering, Ohio 45429)
Filed May 12, 1969, Ser. No. 823,643
Int. Cl. B65d *19/18, 11/18*
U.S. Cl. 150—0.5 **4 Claims**



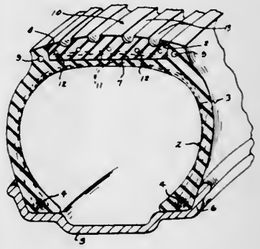
A collapsible aircargo container is disclosed which is particularly adapted for aircraft transportation. The container is secured at its lower edges to a pallet on which the products rest within the container. The latter is formed of a double walled airtight rubberized material having a passageway between the walls to receive air under pressure. One or more spring loaded air valves are inserted in the material of the container and communicate with the compartment formed between the double walls. A frame member is also provided, made of a double walled material, to provide an entrance to the interior of the container. The frame, when charged with air under pressure, will stand upright to support the container material and, when devoid of air, can be moved around hinges to be against the pallet. Adjustable straps of webbing material are secured to the outer surface of the container and the frame member so as firmly to secure the contained product to the pallet and to be protected by the container. After the products have been stowed within the container, the pressure of air in the double walls of the container and frame member is reduced to cause the container material to hug or settle down onto the aggregate contour of the products. The container and frame member can be collapsed by complete removal of air pressure when not in use, to occupy a space no greater than the physical dimensions, i.e. thickness and size of the container material and the attached pallet.

3,578,051
CYLINDER COVER
George L. Hammon, Oakland, Calif., assignor to Chemetron Corporation, Chicago, Ill.
Filed Apr. 1, 1969, Ser. No. 811,844
Int. Cl. B65d *87/36*
U.S. Cl. 150—52 **4 Claims**



Cover for enclosing the valved end of a container for gas material. At least a portion of the cover is resilient and has an open end which is engageable about the cylinder end by hand pressure.

3,578,052
REPLACEABLE TREAD ON AN EXPANDING DIAMETER CAR CARCASS TIRE
Aivars V. Petersons, 1925 Little York Road, Dayton, Ohio
Filed Sept. 19, 1968, Ser. No. 760,931
Int. Cl. B60c *11/02*
U.S. Cl. 152—187 **2 Claims**

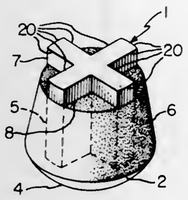


A vehicle tire which provides a simple means of mounting, dismounting, or exchanging tire treads. The tire carcass is designed in such a manner that the diameter increases by 15 percent or more when the tire is inflated to operating or operable pressure. On the carcass, in place of the conventional integral tread there is a wide annular groove or channel having spaced sidewalls. The tread comprises an annular nonstretchable flexible band or belt which snugly fits in the channel between the sidewalls. When the tire is inflated and expands radially outwardly, the nonexpandable tread is securely and firmly held in place in the channel, but it can be removed and replaced when the tire is deflated. The interengaging inner annular surface of the tread member or band and the outer surface or bottom of the tread receiving channel may be formed with complemental, interengaging means or lugs which are forced into interengagement with each other when the annular tread band is fitted into the channel and the tire is inflated to resist relative slippage between the tire and the annular belt tread member.

3,578,053
TIRE STUD
Paul E. Milliken, Massillon, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Sept. 5, 1969, Ser. No. 855,540
Int. Cl. B60c *11/16*
U.S. Cl. 152—210 **12 Claims**

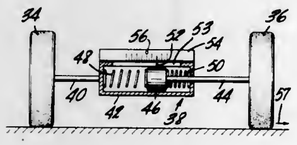
A tire stud having increased traction characteristics due to increased edge contact with the road achieved by the cross-

sectional contour of the traction portion of the stud. In one embodiment, the traction portion is X-shaped in cross section and in another embodiment, the traction portion is L-shaped in cross section. The stud may be inserted directly in



a hole previously molded in a tire tread or it can be encased in an elastomeric plug which is vulcanized to the stud and then the plug with the stud therein is placed within a premolded hole in the tire tread. To more firmly secure the elastomeric plug in the hole, adhesive may be applied.

3,578,054
TIRE COVERS
Jacques Boileau, Clermont-Ferrand, France, assignor to Compagnie Generale Des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand(Puy-de-Dome), France
Filed Feb. 2, 1968, Ser. No. 702,564
Claims priority, application France, Feb. 6, 1967, 93886
Int. Cl. B60c *19/00*
U.S. Cl. 152—330 **4 Claims**



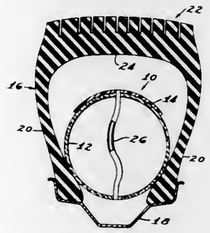
A series of tires for an automotive vehicle is manufactured in accordance with an identical model, on identical machines and under identical conditions. Because of manufacturing tolerances, the tires have a pseudocamber the magnitude of which is an aleatory variable. The pseudocamber is measured for each tire, and those tires having a pseudocamber producing a lateral thrust, when the tires roll at 10 km./h at normal load and pressure on level ground, beyond 0 percent to 6 percent and, preferably, 1 percent to 4 percent of the rated load of tire, are rejected. The remaining tires are marked by any arbitrary symbols the meaning of which is understood by users, to indicate the direction of mounting on a rim. The tires are mounted on their respective rims so that the lateral thrust is outward on the front wheels and inward on the rear wheels.

3,578,055
TREAD WEAR INDICATOR
Tom French, and Vernon E. Gough, Sutton Coldfield, England, assignors to The Dunlop Company Limited, London, England
Filed Oct. 11, 1968, Ser. No. 837,961
Claims priority, application Great Britain, Oct. 18, 1967, 47346/67
Int. Cl. B60c *11/00*
U.S. Cl. 152—330 **3 Claims**

A pneumatic tire having a recess formed in the tread rubber thereof by cutting or moulding a recess shoulder portion formed in the rubber bounding the recess, and a tread wear marker located in the recess having at least a part thereof located radially inwardly of the said shoulder portion and secured in position thereby, the marker comprising, at least in part, material which may be distinguished either

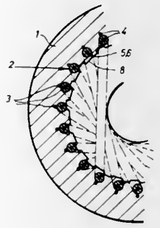
visually or audibly upon rotation of the tire on a hard surface for indicating a degree of tread wear which has occurred in the rubber adjacent the marker.

3,578,056
RUN-FLAT COMBAT TIRE
Walter P. Wynbelt, Royal Oak, Mich., assignor to the United States of America as represented by the Secretary of the Army
Filed May 20, 1969, Ser. No. 826,119
Int. Cl. B60c *17/04*
U.S. Cl. 152—340 **4 Claims**



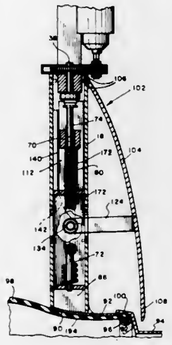
To provide an improved military run-flat combat tire, a conventional tubular tire casing is equipped with a smaller diameter, pressureless, filament wound, reinforced fiberglass toroid capable of supporting the vehicle at relatively high sustained speeds after the tubeless tire has been punctured.

3,578,057
SYNTHETIC RESIN PNEUMATIC TIRE
Ulrich Knipp, Leverkusen; Eckhard Boigk, Leichlingen, and Erwin Weinbrenner, Opladen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
Filed May 27, 1968, Ser. No. 732,155
Claims priority, application Germany, June 2, 1967, F52579
Int. Cl. B60c *9/02*
U.S. Cl. 152—356 **3 Claims**



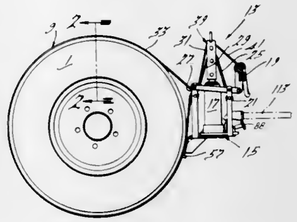
A pneumatic tire made from a synthetic resin is produced using a mold and an annular mold core and has a spacing layer arranged between the windings of a reinforcing insert and the internal surface of the tire.

3,578,058
PNEUMATIC TIRE DISMOUNTING APPARATUS
Chester W. Allen, 635 N. Flora, Wichita, Kans.
Filed July 24, 1969, Ser. No. 844,461
Int. Cl. B60c *25/06*
U.S. Cl. 157—1.17 **21 Claims**



Apparatus for use in dismounting a tire from a wheel comprising an elongated hollow frame having a bifurcated lip at its lower end adapted to be forced between the bead of the tire and the wheel rim. A clamp movably mounted on the frame for movement toward and away from the bifurcated lip to force the latter between the bead and the rim. A foot member slidably mounted in the hollow frame for telescopic downward extension from a retracted position in the frame, with the foot member having a lip portion coextensive with and disposed within the bifurcated lip when the foot member is retracted. Power operable means movable within the frame from an upper to a lower position for initially actuating the clamp toward the bifurcated lips and thence moving the foot member downwardly so that the lip of the latter forces the bead from the rim.

3,578,059
BEAD SPREADER FOR TRUCK TIRES
James R. Uhen, Burlington, and David L. Olson, Racine, Wis., assignors to Tenneco, Inc., Houston, Tex.
Filed Nov. 4, 1968, Ser. No. 773,101
Int. Cl. B60c *25/12*
U.S. Cl. 157—1.21 **5 Claims**

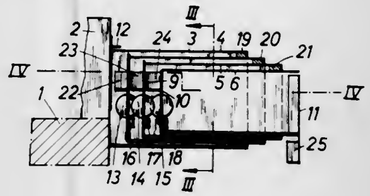


A device for expanding the beads of tubeless tires so as to facilitate filling them with air under pressure comprises a flexible strap that may be looped around the outside of the tire and a device for receiving the ends of the strap and applying tension to the strap. The device preferably includes a frame having a guide neck with rollers through which the strap ends extend with one end being anchored to the frame and the other end extending through a ratchet takeup mechanism mounted on the frame, tension being applied by means of a hydraulic ram assembly connected through rollers to the two end sections of the strap. The hydraulic assembly has a special relief valve to preclude the application of excessive pressure.

3,578,060
VERTICALLY MOVABLE SELF-LOCKING SHUTTER
Lloyd Spencer, 220 Patrician Way, Pasadena, Calif.
Filed Apr. 18, 1969, Ser. No. 817,360
Int. Cl. E06b *9/30*
U.S. Cl. 160—172 **18 Claims**

An exposed shutter having horizontally disposed slats movable between a raised, stacked condition and a lowered, spaced condition; the slats being provided with end fittings slidable on fixed vertical guides and linkage arranged to tilt and lock each slat in a predetermined angular position as it reaches its spaced condition, and further includes a final locking mechanism operable, when the shutter is extended, to secure all the slats so as to resist windloads; the shutter being raised and lowered by tapes which also function to release the locking mechanism.

3,578,061
COVERING DEVICE FOR PROTECTING THE GUIDING PATHS OF MACHINE TOOLS
Friedrich Hascheck, Weidenau, and Kurt Loos, Dreis-Tiefenbach, Germany, assignors to Kabelschlepp G.m.b.H, Siegen (Westphalia), Germany
Filed Dec. 2, 1968, Ser. No. 780,340
Claims priority, application Germany, Dec. 14, 1967, P1,650,983.4
Int. Cl. E05d *15/06*
U.S. Cl. 160—202 **10 Claims**



In combination with guideway means of a machine tool for protecting said guideway means, a slide cover which includes: a plurality of box-shaped members telescopically movable into and out of each other; each of said box-shaped members comprising a top plate and two sideplates extending in the longitudinal direction of said guideway means, each of said box-shaped members also comprising supporting plate means adapted to engage and to be supported by said guideway means, one of the outer ones of said box-shaped

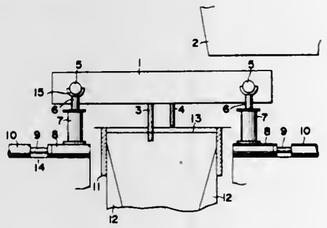
members being provided with an end face wall and being adapted to be connected to a reciprocable member of said machine tool; and coupling means between at least two adjacent box-shaped members and between said end face wall and the next box-shaped member, said coupling means being operable automatically to couple the respective adjacent box-shaped members to each other in response to the said respective box-shaped members with the coupling means therebetween having been telescoped into each other to their possible maximum extent to thereby permit all box-shaped members when telescoped into each other to move beyond the end of said guideway so as to form a cantilever.

3,578,062

METHOD OF AND APPARATUS FOR CONTINUOUS CASTING WITH IMMERSION-TYPE LONG NOZZLES

Shigeki Soeda, Yokohama-shi; Hidetaro Nemoto, Hasegawa; Tomohiro Hasegawa, and Yasuhiro Kaneko, Yokohama-shi, Japan, assignors to Nippon Kokan Kabushiki Kaisha

Filed Feb. 25, 1969, Ser. No. 802,118
Claims priority, application Japan, Mar. 5, 1968, 43/13858
Int. Cl. B22d *11/00*
U.S. Cl. 164—82 **2 Claims**



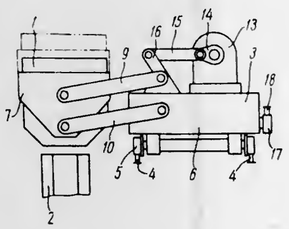
A single tundish is used provided with two or more immersion-type long (submerged extended) nozzles of different length. The tundish is lowered to immerse the longest immersion-type nozzle to a predetermined depth below the surface of the molten steel in a casting mold, the tundish is elevated to cut off the longest nozzle before it is subjected to erosion, and again the tundish is lowered to immerse the next longest immersion-type nozzle to said predetermined depth to continue the casting operation.

3,578,063

DEVICE FOR SETTING TUNDISH ABOVE MOULD OF MACHINE FOR CONTINUOUS CASTING OF METAL

Vitaly Maximovich Niskovskikh, Ulitsa Festivalnaya, 21, KV. 60, Sverdlovsk; Alexei Ivanovich Varaxin, Khimkikhovrino, Ulitsa Dyben KO, 22, Korpus 5, KV, 374, Moscow; Evgeny Jukhimovich Gelfenbein, Ulitsa 40 Let Oktyabrya, 28, KV. 51; Lev Isaevich Safronovich, Ulitsa Kirovograd Skaya, 71, KV.2, and Leonid Georgievich Kuznetsov, Ulitsa Pobedy, 59, KV. 5, Sverdlovsk, U.S.S.R.

Filed July 12, 1968, Ser. No. 744,520
Int. Cl. B22d *11/10*
U.S. Cl. 164—281 **5 Claims**



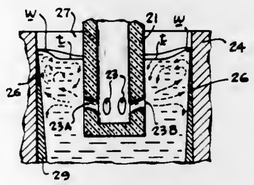
A device for positioning a tundish above a continuous casting mold during the casting process, the device consisting of a carriage movably mounted on rails, which carriage carries the tundish in cantilever fashion. Specifically, the carriage has mounted thereon a lifting mechanism which actuates a lever system, connected to a support means holding the tundish. The lever system takes the form of four links, two links being mounted at either end of the tundish between the support means and the carriage, and each pair of links being in the shape of a parallelogram, especially when considering an imaginary line drawn between the pivot axes at each end of each pair of links.

3,578,064

CONTINUOUS CASTING APPARATUS

Norman T. Mills, Highland; Charles R. Jackson, Hammond, and James W. Halley, Chesterton, Ind., assignors to Inland Steel Company, Chicago, Ill.

Filed Nov. 26, 1968, Ser. No. 779,088
Int. Cl. B22d *11/10*
U.S. Cl. 164—281 **10 Claims**



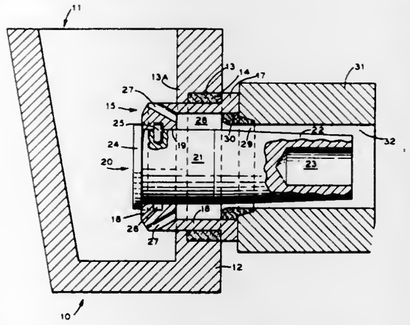
A continuous casting process whereby objectionable surface inclusions are substantially eliminated from the continuous casting and wherein molten steel is introduced into a continuous casting mold by an injection means which discharges the molten metal into the mold below the surface of the molten metal pool maintained in the upper end of the mold through controlled streams having an upwardly and outwardly flowing component which contacts the solidifying casting surfaces to wash away objectionable inclusions normally frozen into the casting and concentrates the objectionable inclusions on the surface of the molten metal where they can be readily removed. Injection nozzles adapted for use with rectangular and square continuous casting molds comprise tubular sections having circumferentially spaced lateral discharge openings for introducing the molten metal into the mold so as to uniformly contact those surfaces of the casting from which objectionable inclusions must be substantially excluded.

3,578,065

MANDREL HOLDER FOR HORIZONTAL PIPE CASTING APPARATUS

Reinhold Langer, Garbsen, Germany, assignor to Kabel-und Metallwerke Gutehoffnung-shutte Aktiengesellschaft, Hannover, Germany

Filed Aug. 28, 1969, Ser. No. 853,896
Claims priority, application Germany, Aug. 31, 1968, P1,758,902.5
Int. Cl. B22d *11/10*
U.S. Cl. 164—281 **7 Claims**



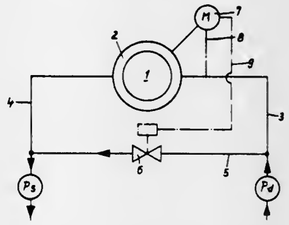
A holder for a mandrel mounted in a metal casting crucible to continuously form pipe; the casting operation being of the horizontal type and the holder accurately centering the mandrel in respect to the tube mold.

3,578,066

APPARATUS FOR THE HEATING AND COOLING OF MOULDS FOR THE PRODUCTION OF PLASTIC BODIES

Anton J. Vox, Ruit, Germany, assignor to Thermovox G.m.b.H. Kunststoffmaschinen, Ruit, Germany

Filed Jan. 31, 1969, Ser. No. 795,569
Claims priority, application Germany, Feb. 2, 1968, P1704375.3;P1704376.4
Int. Cl. F25b *29/00*
U.S. Cl. 165—27 **15 Claims**



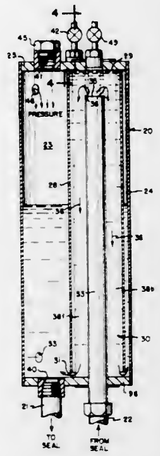
In combination with a mould having an outer and an inner wall defining a space therebetween for the flow of cooling or heating fluid therethrough, fluid circuit means including a pressure pump for circulating fluid under pressure through the space and bypass means connected to the circuit means for bypassing part of the fluid pumped by the pump past the mould to avoid overpressure in the space and possible deformation of the mould walls.

3,578,067

SELF-COOLING MECHANICAL SEAL LUBRICATOR

Seymour Schlosberg, East Brunswick, N.J., assignor to R. Gelb & Sons, Inc.

Filed July 10, 1970, Ser. No. 53,808
Int. Cl. B60h *1/00*
U.S. Cl. 165—39 **7 Claims**



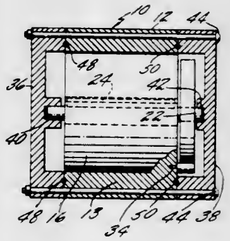
Apparatus for lubricating a mechanical seal between a rotatable shaft and its housing comprises a fluidtight reservoir. A tubular member is disposed within the reservoir and is secured to an upper end wall of the reservoir to define therewithin a lubricant-cooling chamber. The lower end portion of the tubular member is disposed sufficiently above a lower end wall of the reservoir to permit circulation of lubricant between the reservoir and the cooling chamber. A lubricant return conduit extends upwardly through the lower end wall into the cooling chamber and terminates at a point sufficiently below the upper end wall to permit circulation of returned lubricant throughout the cooling chamber. Means are provided for cooling the returned lubricant as it circulates downwardly within the cooling chamber. In operation, the reservoir is filled and gas under pressure is introduced therein to force the lubricant within the cooling chamber upwardly to a level sufficient to provide adequate heat transfer from the returned lubricant to the cooling means.

3,578,068

TEMPERATURE RESPONSIVE PASSIVE VARIABLE THERMAL CONDUCTANCE DEVICE

Daniel L. Elliott, Southington, and Gary D. Burr, Berlin, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed June 11, 1969, Ser. No. 832,263
Int. Cl. B60h *1/00*
U.S. Cl. 165—39 **9 Claims**



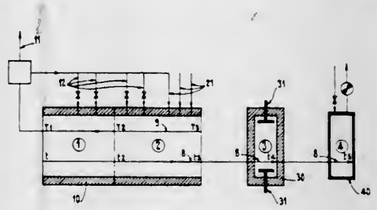
Heat conductivity through a device in a given direction is achieved by a pair of relatively rotatable thermal anisotropies having mutual interfacing surfaces of constant area. The overall thermal conductance of the assembly varies with the relative angular position of the elements in response to a temperature responsive element such as a bimetallic spring or a fluid-charged bellows.

3,578,069

APPARATUS FOR FIRING CARBON-CONTAINING PRODUCTS

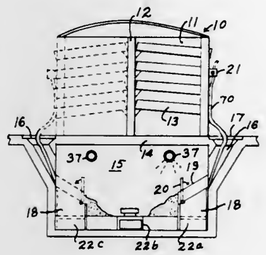
Paul Morel, Le Vesinet; Jean-Pierre Givry, Ville D'Avry, and Philippe Voisin, Saint-Jean de Maurienne, France, assignors to Compagnie Pechiney, Paris, France

Filed Feb. 10, 1969, Ser. No. 797,738
Claims priority, application France, Feb. 19, 1968, 140,305
Int. Cl. F25b *29/00*
U.S. Cl. 165—61 **7 Claims**



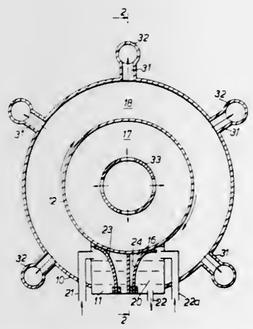
Method and apparatus for firing carbon-containing products which involve processing the products through four zones, including a heating zone, a zone for release and combustion of volatile materials, a final heating zone, and a cooling zone, and in which the final heating zone provides for the heating of the products from the inside out thereby to achieve uniform temperature distribution in this stage of the operation to provide a more efficient process and a more desirable product.

3,578,070
APPARATUS FOR SALVAGING BLUE POWDER FROM ZINC ORE FURNACES AND THE LIKE
Ive L. Martin, P.O. Box 2256, Modesto, Calif.
Filed Aug. 19, 1968, Ser. No. 753,380
Int. Cl. C22b *19/02*
U.S. Cl. 165—61 **9 Claims**



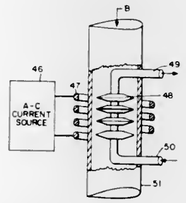
A material smelting and processing plant which is usable for smelting zinc ore or also glass materials. It includes a main housing, the upper portion of which contains ore or glass smelting containers or pots, with heating means for raising their temperature to the smelting point, so that the zinc ore is smelted into liquid metallic zinc which is decanted from the pots, while the remaining blue powder containing richly zinc is reamed out and dropped into a compartment in the basement of the main housing and onto conveyors for carrying it to an end receptacle for further smelting and processing. The remaining zinc ore slag is then reamed out of the pots and dropped into a waste compartment in the basement and onto conveyors for removal as waste. Cooling sprays are in the basement for reducing the temperature of the materials and to protect the conveyors and compartments from the intense heat. The plant when used to produce glass also has means for removing the glass from the containers, dropping it into the basement onto conveyors and refrigeration for cooling the spray fluid below freezing to cool the hot glass. It is then conveyed to end receptacles for further processing such as crushing, etc.

3,578,071
CONCENTRIC EVAPORATION-CONDENSATION, ROTARY, THIN FILM, HEAT TRANSFER APPARATUS
Arthur K. Johnston, New Lambton, New South Wales, Australia, assignor to The University of Newcastle, Newcastle, New South Wales, Australia
Filed Apr. 8, 1969, Ser. No. 814,352
Claims priority, application Australia, Apr. 11, 1968, 36388/68
Int. Cl. F28f *5/00*
U.S. Cl. 165—66 **9 Claims**



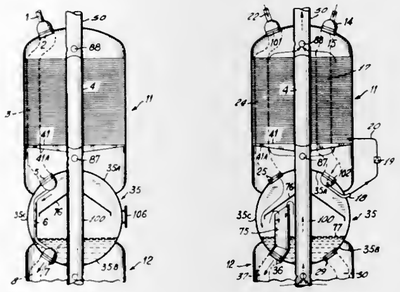
The invention relates to an apparatus for transfer of heat between solids, liquids and vapors and for transfer of mass between and within liquids and vapors, the apparatus comprising a rotatable, substantially cylindrical film carrier onto which a thin film of a material to be vaporized is deposited by stationary depositing means, a vaporizing zone surrounding the film carrier, and a condensation zone within the film carrier into which a vaporized component of the material deposited on the film carrier is directing for condensing. The film carrier constitutes a common heat transfer boundary between the vaporizing and condensation zones and latent heat emitted from material during condensation passes through the film carrier to effect the vaporization of the material on the outside of the film carrier. The invention has particular application as a desalination apparatus.

3,578,072
HEAT EXCHANGE APPARATUS
Henry H. Kolm, Wayland, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Continuation-in-part of application Ser. No. 761,048, Sept. 20, 1968. This application Aug. 11, 1969, Ser. No. 849,127
Int. Cl. F28d *11/06*
U.S. Cl. 165—84 **3 Claims**



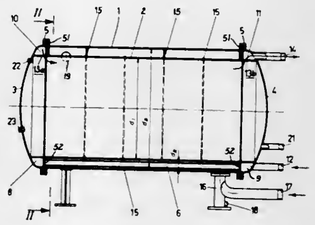
Heat exchange apparatus is disclosed in which the heat exchange surfaces are vibrated by electric eddy current means to enhance heat transfer between said surfaces and a medium.

3,578,073
HEAT EXCHANGE APPARATUS WITH INTEGRAL FORMATION OF HEAT EXCHANGERS AND SEPARATORS
Maurice Bosquain, Paris, France, assignor to L'Air Liquide Societe Anonyme Pour L'Etude Et L'Exploitation Des Procedes Georges Claude
Filed Mar. 27, 1968, Ser. No. 716,486
Claims priority, application France, Mar. 3 1, 1967, 100919
Int. Cl. F25j *1/00, 5/00, 3/00*
U.S. Cl. 165—111 **2 Claims**



An indirect heat exchange assembly comprises superimposed heat exchangers with nests of tubes and liquid separators disposed between the exchangers. The nests of tubes open onto the walls of the separators, which thus serve the purpose of headers or collectors. Further features are that the separators can have their bases common to those of adjacent exchangers but their lateral walls exposed for easy access; the different exchangers can be disposed in a common shell with the two successive exchangers of which the exchange surfaces are the smallest disposed concentrically inside the shell, these latter two exchangers having coiled tubes with the shell of the smaller of the two exchangers forming the core of the larger coiled nest of tubes.

3,578,074
WARM WATER PRODUCER
Otto Domok, Luzern, Switzerland, assignor to Strebelwerk AG, Rothrist, Switzerland
Filed Mar. 5, 1969, Ser. No. 804,461
Claims priority, application Switzerland, Mar. 14, 1968, 3757/68
Int. Cl. F24h *1/46;* **F28d** *1/06*
U.S. Cl. 165—132 **7 Claims**



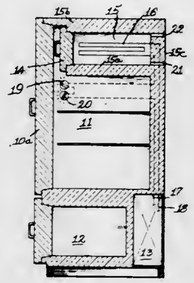
A series of pipes in the space between the outer casing and the inner lining carry water to be heated back and forth until it is finally emptied into the interior of the lining which acts as a reservoir from which the heated water can be drawn off. Hot heating water flows in the space between the outer casing and the inner lining.

3,578,075
CORRUGATED TUBING
Joseph Winter, New Haven, Conn., assignor to Olin Corporation
Continuation-in-part of application Ser. No. 679,459, Oct. 31, 1967, now abandoned. This application Oct. 29, 1969, Ser. No. 872,154
Int. Cl. F28f *1/06, 1/10*
U.S. Cl. 165—177 **4 Claims**

The disclosure teaches an improved corrugated metal tubing having improved corrosion resistance and heat transfer characteristics. The tubing is characterized by having a plurality of lands and grooves extending helically along the circumference thereof and having in cross section a plurality of uniform, symmetrical, wavelike indentations.

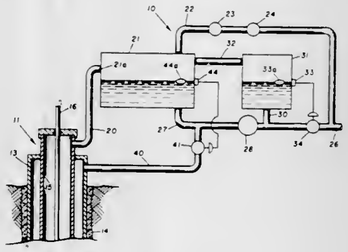
3,578,076
THAWING-OUT MEANS FOR REFRIGERATORS
Luis Camejo, Union City, New Jersey, assignor of one-third to Jose Bovantes, Fort Lee, New Jersey, and one-third to Orlando Martines, Union City, New Jersey
Filed May 19, 1969, Ser. No. 825,546
Int. Cl. F25d *21/00*
U.S. Cl. 165—63 **4 Claims**

The invention relates to refrigerator structure embodying means therein for thawing out frozen or refrigerated foodstuffs within selected time intervals and comprises an accessible chamber within the interior of the refrigerator, provided with adjustable and controlled heating means to effectuate an accelerated defrosting operation. Means are



provided to cause air circulation within the said chamber for oxygenation and prevention of heat build-up to approximate defrosting under the normal ambient conditions present in conventional defrosting.

3,578,077
FLOW CONTROL SYSTEM AND METHOD
Edwin E. Glenn, Jr., Dallas; Vasel R. Slover, and Malcolm K. Strubhar, Irving, Tex., assignors to Mobil Oil Corporation
Filed May 27, 1968, Ser. No. 732,460
Int. Cl. E21b *43/00*
U.S. Cl. 166—68 **9 Claims**

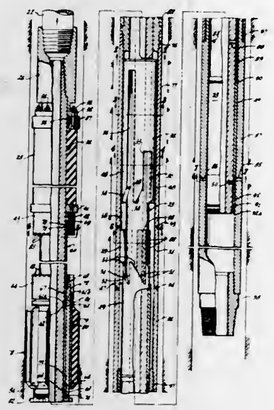


This specification discloses a method and apparatus for controlling flow of a multiphase fluid stream from a partially depleting supply source such as a pumping oil well so that the flow rate of the liquid phase thereof is maintained substantially constant. Where said source is an oil well, the multiphase fluid is pumped from the well into a separator where it is separated into its liquid and gas phases. A constant volume pump withdraws liquid from the separator at a set flow rate. A conduit connects the separator back to the well and has a valve therein which is controlled by the liquid level in the separator whereby a portion of the liquid in the separator can be returned to the well to maintain sufficient fluid in the well for the well pump to operate at its capacity.

3,578,078
EARTH BOREHOLE TOOL
Harold E. Shillander, Albuquerque, N. Mex., assignor to General Oil Tools, Inc., Phoenix, Ariz.
Filed Jan. 12, 1970, Ser. No. 2,115
Int. Cl. E21b *23/00*
U.S. Cl. 166—152 **20 Claims**

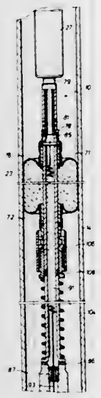
An oil well drill string or stem having a tubular mandrel fast on its lower end and a drive sleeve assembly telescoped onto the mandrel. A resilient packer fastened at its upper end to the mandrel is slidable on the mandrel above the drive sleeve assembly, and a retractor secured to the lower end of the packer with a lost-motion connection is alternately

latched to the mandrel when the packer is extended, unlatched by the drive sleeve assembly as the latter moves upwardly relative to the mandrel to compress the packer longitudinally and thus expand it radially, and latched to the drive sleeve assembly for positive longitudinal extension and



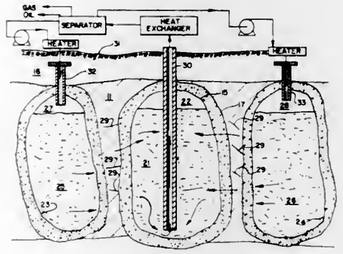
radial collapse of the packer as it is returned to the latched condition. Circulation ports in the drive sleeve assembly are opened only when the packer is expanded, and a driving spline connection between the drive sleeve assembly and the mandrel has squared spline elements for increased bearing strength.

3,578,079
APPARATUS FOR PLUGGING WELL BORES WITH HARDENABLE FLUENT SUBSTANCES
Carl V. Alexander, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Nov. 12, 1969, Ser. No. 875,877
Int. Cl. E21b *33/127*
U.S. Cl. 166—187 **17 Claims**



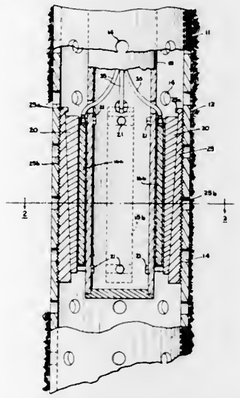
As a preferred embodiment of the present invention disclosed herein, a tubular bag is sealingly mounted around an elongated body and operatively arranged to be expanded into engagement with the walls of a well bore by discharging thereinto an initially fluent hardenable substance contained in a selectively-operable displacement assembly releasably coupled to the body. After the fluent substance has expanded the bag, one end of the bag is secured to the body, selectively released biasing means are operatively arranged for imposing opposed axial forces against the expanded bag to depress the ends of the bag toward one another. In this manner, unbalanced pressure forces acting on the tool will only further urge the bag radially outwardly against the walls of the well bore with an added force for securely anchoring the tool against longitudinal movement until the fluent substance has solidified.

3,578,080
METHOD OF PRODUCING SHALE OIL FROM AN OIL SHALE FORMATION
Philip J. Closmann, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
Filed June 10, 1968, Ser. No. 735,684
Int. Cl. E21b *43/24, 43/26, 43/27*
U.S. Cl. 166—248 **4 Claims**



A method of producing shale oil from a subterranean oil shale formation by exploding a relatively high energy explosive device therein thereby forming a chimney of rubble within the formation having fractures extending from the chimney into the formation. A plurality of spaced wells are extended into the formation radially outwardly from the chimney and adjacent to at least some of the fractures. Fluid flow paths are formed from the wells through the fractures into the chimney and fluid is circulated from the wells through these fluid flow paths and into the chimney at rates creating a pressure drop from the wells to the chimney. Oil shale-reactive properties are imparted to the circulating fluid whereby the fluid reacts with the oil shale thereby moving solid components thereof into void spaces formed within the chimney thereby increasing the permeability of the oil shale formation relative to the permeability of the chimney in regions surrounding the chimney.

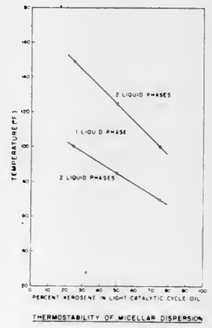
3,578,081
SONIC METHOD AND APPARATUS FOR AUGMENTING THE FLOW OF OIL FROM OIL BEARING STRATA
Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif.
Filed May 16, 1969, Ser. No. 825,142
Int. Cl. E21b *43/25*
U.S. Cl. 166—249 **6 Claims**



A source of sonic vibrational energy is tightly coupled to the walls of an oil well casing, this energy source being

adapted to vibrationally distort the casing in an elliptical pattern. The casing is sonically energized in this manner, the sonic energy being transferred to the surrounding oil bearing strata to induce the migration of the oil particles therein into the well. The energy source may be two pairs of piezoelectric crystals oriented on axes normal to each other, or a pair of rollers driven around the longitudinal axis of the casing.

3,578,082
AROMATICITY INFLUENCING THE THERMOSTABILITY OF MICELLAR DISPERSIONS
John A. Davis Jr., and William J. Kunzman, Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio
Continuation-in-part of application Ser. No. 746,391, July 22, 1968, now Patent No. 3,495,660. This application Nov. 6, 1969, Ser. No. 870,244
Int. Cl. E21b *43/22*
U.S. Cl. 166—252 **15 Claims**

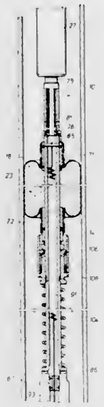


THERMOSTABILITY OF MICELLAR DISPERSION

An improved process of recovering hydrocarbon from a hydrocarbon-bearing subterranean formation wherein a micellar dispersion comprised a hydrocarbon, surfactant and aqueous medium is injected into and displaced through the formation to recover hydrocarbon through a production means, the improvement comprising determining the temperature of the formation, mixing with the surfactant and aqueous medium a hydrocarbon having sufficient aromaticity to obtain a stable micellar dispersion at the temperature of the formation. The micellar dispersion can optionally contain cosurfactant and/or electrolyte. Such a process is especially useful to recover crude oil in a secondary or tertiary oil recovery process wherein the formation is at a temperature in excess of ambient temperature.

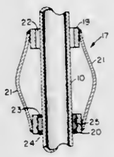
3,578,083
METHODS AND APPARATUS FOR PLUGGING WELL BORES WITH HARDENABLE FLUENT SUBSTANCES
Ronald A. Anderson, and Nevyl G. Owens, Houston, Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.
Filed Nov. 12, 1969, Ser. No. 875,681
Int. Cl. E21b *33/127*
U.S. Cl. 166—285 **20 Claims**

As a preferred embodiment of the apparatus of the present invention disclosed herein, a tubular bag is sealingly mounted around an elongated body and operatively arranged to be expanded into engagement with the walls of a well bore by discharging thereinto an initially fluent hardenable substance contained in a selectively operable displacement assembly releasably coupled to the body. Biasing means are operatively arranged for imposing opposed axial forces against the expanded bag to depress the ends of the bag toward one another. In this manner, unbalanced pressure forces acting on the tool will only further urge the bag radially outwardly against the walls of the well bore with an added force for securely anchoring the tool against longitudinal movement until the fluent substance has solidified. In practicing the methods of the present invention, a yieldable enclosed container of a fluent substance capable of setting up into a hardened mass is positioned at a selected location in a well bore with the container being peripherally engaged with the walls of the well bore. Opposed axial forces are applied to the opposite ends of the container to form the container into a generally toroidal configuration. Thereafter configuration.



Thereafter, unbalanced pressure differentials acting across the container will be effective for further increasing the pressure of the fluent substance for firmly urging the container outwardly against the walls of the well bore with a correspondingly increasing frictional force to secure the container in position until the fluent material therein has hardened.

3,578,084
THERMAL WELL COMPLETION METHOD AND APPARATUS
Caurino C. Bombardieri, Calgary, Alberta, and James F. Tod, Edmonton, Alberta, Canada, assignors to Esso Production Research Company
Filed June 23, 1969, Ser. No. 835,386
Int. Cl. E21b *33/14, 17/10*
U.S. Cl. 166—288 **14 Claims**



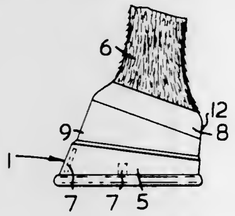
A method and apparatus for attaching subsurface cementing devices to the periphery of free moving casing for use in thermal wells. Centralizers, wall scratchers, cement baskets, and the like are secured to the free-moving casing by means of a fusible material which is rigid at normal subsurface temperatures and which is deformable at thermal treatment temperatures.

3,578,085
METHOD OF RESTORING FORMATION PERMEABILITY
William G. Halbert, Butte, Mont., assignor to Tenneco Oil Company, Houston, Tex.
Filed Jan. 15, 1970, Ser. No. 3,230
Int. Cl. E21b *43/27*
U.S. Cl. 166—307 **5 Claims**

A method for restoring original permeability to a subterranean oil producing formation penetrated by a well. The

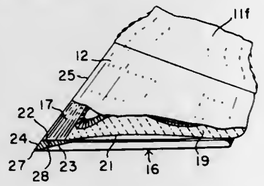
method includes the steps of injecting into the formation a slug of pressurized gasiform fluid, then a slug of aqueous silicate solution, retaining the solution in the formation for 2—24 hours, then removing the solution by the force of the pressurized fluid. These steps accomplish dispersal of clay particles blocking formation permeability and restoration of the formation's original permeability.

3,578,086
RUBBER HORSESHOE
Kenneth M. Giles, Chesterville, Ontario, Canada
Filed Nov. 4, 1968, Ser. No. 772,978
Claims priority, application Canada, Nov. 2, 1967, 004,099
Int. Cl. A01l *03/00*
U.S. Cl. 168—18 **12 Claims**



A reuseable unitary horseshoe formed from a hard resilient natural or synthetic resinous material which may be readily fitted to and removed from a horse's hoof, said shoe having a lip extending from its outer edge shaped to accommodate the lower part of the hoof and being provided with means adapted to releasably reduce the distance between the free ends of the shoe against the natural resilience of the shoe whereby to adjust the shape of the shoe for fitting to the horse's hoof.

3,578,087
HORSESHOE
Max B. Kirkpatrick, Anchorage, Alaska (P.O. Box 1509, Wickenburg, Ariz. 85358); Andrew Harvey, and John M. Sparks, III, P.O. Box 1509, Wickenburg, Ariz.
Filed Dec. 6, 1968, Ser. No. 781,717
Int. Cl. A01j *01/02*
U.S. Cl. 168—24 **8 Claims**

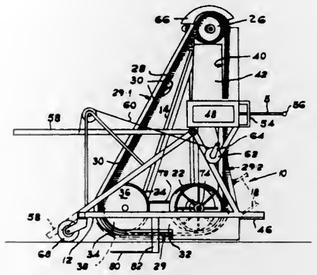


A horseshoe made of a single piece of metal or the like has a peripheral side surface that is inclined in substantial conformity with the hoof wall and a relatively smooth continuous bottom ground engaging surface that is concave inwardly from a relatively sharp edged intersection with the side surface.

3,578,088
PLANT HARVESTING MACHINE
Roedolf Johannes Raath, 286 Deverish Street, Pretoria, Transvaal Province, South Africa
Filed Apr. 24, 1969, Ser. No. 819,024
Claims priority, application South Africa, Apr. 26, 1968, 68-2696
Int. Cl. A01d *17/10*
U.S. Cl. 171—62 **6 Claims**

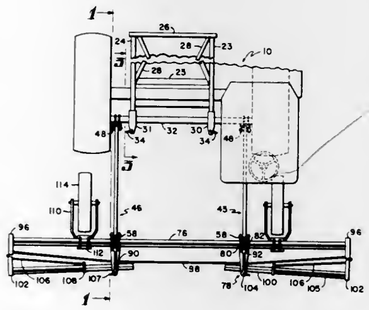
The invention relates to a machine for the harvesting of plants and more particularly pulling groundnut plants from the soil and gathering such plants according to an orderly arrangement.

The machine according to the invention provides a beltlike conveyor, disposed at an angle to the direction of travel of the machine, spaced fingers projecting from an edge of the conveyor, and plant guide means forwardly divergingly disposed relative to the conveyor for directing and holding



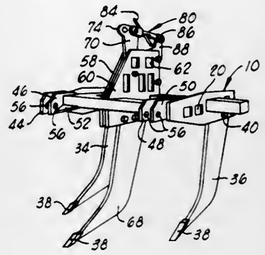
the plants between fingers and against the conveyor so that the plants are pulled upwardly at the position when the conveyor commences upward movement. With the conveyor means are provided to remove extracted plants for orderly side by side collection on a surface. In addition means are provided for discharge of the plants with the root ends directed in the same directions.

3,578,089
ADJUSTABLE IMPLEMENT-CARRYING ASSEMBLY
Ronald J. Fischer, Wapakoneta; Wilbur E. Groeneveld, Celina, and Gerald O. Irvine, Coldwater, Ohio, assignors to Avco Corporation, Coldwater, Ohio
Filed Feb. 4, 1969, Ser. No. 796,459
Int. Cl. A01b *59/048, 63/32*
U.S. Cl. 172—277 **7 Claims**



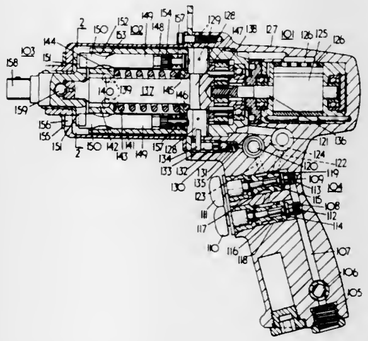
The disclosure illustrates an implement-carrying assembly for use with a wheeled transport vehicle. A tool bar is secured to the forward end of the transport vehicle by a pair of laterally adjustable parallel lift linkages. Each of the parallel lift linkages has a provision for detachable mounting of a hydraulic actuator for raising and lowering the tool bar through a linkage arrangement connected to the lifting links. The lift linkages are laterally adjustable relative to one another and to the tool bar to facilitate the mounting of implements for various row spacings. The tool bar is stiffened by truss rods supported in such a manner that they provide support irrespective of the relative positions of the tool bar and the lifting linkages.

3,578,090
SUBSOILER CHISEL PLOW
Ted L. Cline, P.O. Box 38, Rush Springs, Okla.
Filed Feb. 4, 1969, Ser. No. 796,477
Int. Cl. A01b *13/08, 59/043*
U.S. Cl. 172—439 **5 Claims**



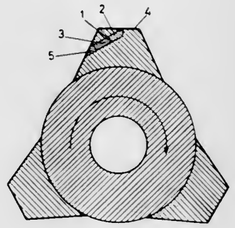
A subsoiler chisel plow including a horizontal, perforated or apertured frame having a plurality of downwardly and forwardly extending chisel teeth secured to the frame. The frame has pairs of horizontally spaced hitch brackets on the forward side thereof and has a special angle of attack adjustment structure projecting upwardly therefrom and adapted for connection to the central hitch of a towing vehicle having a three-point hitch connection.

3,578,091
POWER-OPERATED IMPACT WRENCH OR SCREWDRIVER
Ronald Frederick States, London, England, assignor to Desoutter Brothers Limited, Hendon, London, England
Filed Sept. 29, 1969, Ser. No. 861,898
Claims priority, application Great Britain, Nov. 29, 1968, 56653/68
Int. Cl. B25b *23/14*
U.S. Cl. 173—12 **10 Claims**



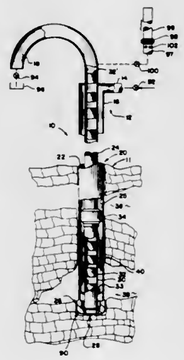
A power-operated impact wrench, screwdriver or like rotary tool with relatively movable hammer and anvil members and means for automatically causing them to become engaged and disengaged cyclically in which there is means for causing disengagement of the hammer members from the anvil members at a value of torque above a predetermined value comprising an inertia means which is coupled to the hammer member by resilient means the values of which are so chosen that values of torque below the predetermined cutoff value the inertia means is constrained by the resilient means from moving relative to the hammer means and the tool operates in a normal manner while at a value of torque above the predetermined value inertia means move against the action of the resilient means thereby to allow the amount of disengagement movement of members to increase and operate control means to interrupt a supply of power to the tool.

3,578,092
DRILLING TOOLS
Hans-Jurgen Tesch, Hannover; Gunther Haverkamp, Hamburg; Herbert Becker; Alexander Wacker, Frankfurt, Main, and Hans Gotte, Kelkheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt, Main, Germany
Filed Feb. 11, 1966, Ser. No. 526,740
Claims priority, application Germany, Feb. 16, 1965, F45,256
Int. Cl. E21b *13/00*
U.S. Cl. 175—39 **10 Claims**



A drilling tool has been provided which has a gastight cavity therein, the entrance of which cavity is preferably positioned away from a wear surface of the tool and which cavity contains krypton ^{85} as a wear indicating means either for a bearing wear surface or for an abrasive drilling wear surface. The indicating means are activated when, because of wear, the cavity is punctured and krypton ^{85} escapes or is expelled by means of auxiliary agents. The method of marking the tools as well as the tools thus marked are within the scope of the invention. Further, the improvement in the method of drilling deep bore holes with a tool possessing these indicating means is similarly within the scope of the disclosed invention.

3,578,093
METHOD FOR DRILLING AND CORING
Wayland D. Elenburg, P. O. Box 1588, Monahans, Tex.
Division of Ser. No. 714,551, Mar. 20, 1968, Pat. No. 3,473,517, Oct. 21, 1969, application May 19, 1969, Ser. No. 825,524
Int. Cl. E21b *9/20, 49/00*
U.S. Cl. 175—60 **12 Claims**



A method of drilling bore holes which enables a cylindrical solid core sample to be obtained from a formation. A coring bit together with a core barrel and concentrically arranged drill pipe provides central and annular passageways. The annular passageway is used for circulating fluid to the bit and back up the bore hole annulus while the central passageway

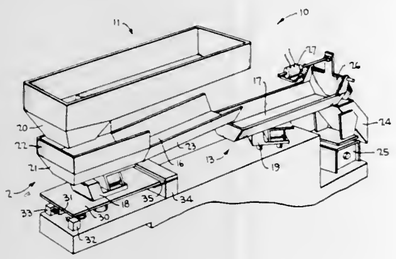
provides for the return of drilling fluid and cores. The circulating fluid is forced down through the drill string annulus to the drill bit, and back up through the hole annulus to thereby remove debris and cool the bit in an improved manner. The cores which have been cut by the bit are accumulated within the core barrel and from time to time the pressure of the drilling fluid is increased while the central passageway is opened to the flow of fluid, thereby forcing the fluid to flow into and up through the central passageway, carrying the accumulated cores therewith. A predetermined pressure drop is maintained across the face of the diamond bit by adjusting the bearing pressure thereof with respect to the formation to thereby enable the bit to cooperate with the formation in a manner analogous to the action of a valve.

3,578,094

FEEDING SYSTEM FOR CONSTANT PRODUCT FLOW

Nelson R. Henry, and Donald R. Middour, Decatur, Ga., assignors to The Woodman Company, Inc., Decatur, Ga.

Filed Sept. 13, 1968, Ser. No. 759,567
Int. Cl. G01g *13/16*
U.S. Cl. 177—108 **4 Claims**



A feeding system including a plurality of in-line vibratory conveyors in which bulk feed is transformed into uniform single-file or column feed whereby product in flight from the system at any given time is equal. A hopper conveyor transfers multiple layers of product to a primary vibratory feeder in response to the demand as gauged by the total weight of the product in said feeder. The primary feeder subcombination employs horizontal section and a contiguous inclined section with a feeding step in between to form a wedge-shaped body of product for regulation of product flow and for thinning out of the product to a single layer with multiple rows. The product then enters a secondary vibratory feeder having its vibrator unit attached at an acute angle to the longitudinal axis of the feeder pan whereby the multirow flow is converted into the single-file flow against a side guide wall of the feeder pan.

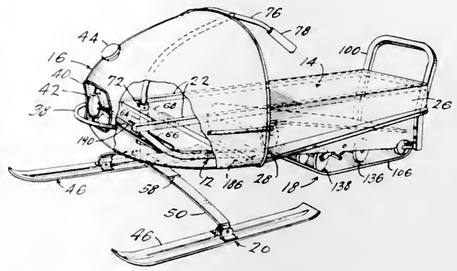
3,578,095

COMPACT SNOW VEHICLE

Hans Hauser, Fredericktown, Ohio, assignor to The J. B. Foote Foundry Co., Fredericktown, Ohio

Division of Ser. No. 724,692, Apr. 29, 1968, Pat. No. 3,507,346, this application Mar. 3, 1969, Ser. No. 803,552
1969, Ser. No. 803,552
Int. Cl. B62m *27/02*
U.S. Cl. 180—5R **5 Claims**

A snow vehicle or snowmobile is provided which is especially designed for children and yet can still carry a fully grown man. The snowmobile is small, of a simple, relatively inexpensive design, and is intended to sell for a fraction of the cost of conventional snowmobiles so as to reach a wide market. The snow vehicle, the components of which are in a



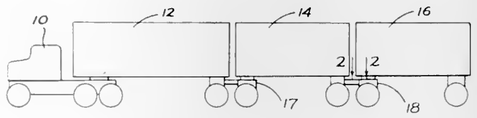
compact arrangement, features a unique ski structure and also a unique belt driving and supporting unit.

3,578,096

AUTOMATIC THROTTLE CONTROL FOR AUXILIARY MOTORS DRIVING DRAWBAR-TOWED VEHICLES

Chester T. Pearson, 1102 S. W. Stephenson St., Portland, Oreg.

Filed June 25, 1968, Ser. No. 739,807
Int. Cl. B62d *59/04*
U.S. Cl. 180—14 **7 Claims**



An automatic throttle control for auxiliary motors driving drawbar-towed trailing vehicles comprises means mounting the drawbar resiliently for longitudinal movement, a throttle control motor and link means operatively linking the throttle control motor to the throttle. Actuating means for the throttle control motor are connected to the drawbar and adjust the throttle proportionately to longitudinal movement of the drawbar. Accordingly, as the vehicle is towed up a hill, movement of the drawbar adjusts the throttle setting to accelerate the auxiliary drive motor. As the vehicle descends the hill, the reverse drawbar movement and throttle adjustment occur.

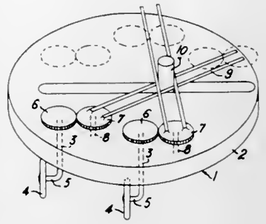
3,578,097

SYSTEM FOR CONTROLLING THE STEERING OF VEHICLE WHEELS

Jean-pierre Guilbaud, Jouars Ponchartrain, and Jean Vertut, Paris, France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Apr. 1, 1969, Ser. No. 812,037
Claims priority, application France, Apr. 9, 1968, 147,453
Int. Cl. B62d *5/04*
U.S. Cl. 180—79.1 **12 Claims**

In a steering control system for vehicle wheels in which rotational axis of the wheels are disposed in a plane at the vertices of a polygon which can be inscribed within a circle referred to as a base circle, the direction of the axes of rotation of the wheels is caused to converge continuously towards a common point referred to as the center of rotation of the vehicle and the circle which circumscribes the base polygon in the base plane corresponds by means of a geometrical transformation to a reference circle in a reference plane, said center of rotation being related alternately its



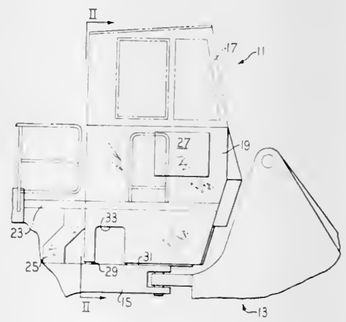
transformed point in said reference plane and to the harmonic conjugate of said point with respect to said reference circle.

3,578,098

OPERATOR STATION AND SUPPORT

Lawrence F. Clancy, Peoria; Frank A. Grooss, and Richard W. Luttrell, Morton, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 28, 1969, Ser. No. 803,279
Int. Cl. B62d *33/06*
U.S. Cl. 180—89 **6 Claims**



A rigid support structure, formed as an integral part of a vehicle such as a large earthmoving machine. The structure incorporates the lower half of an operator's station safety cab, the upper portion of the cab being removable therefrom.

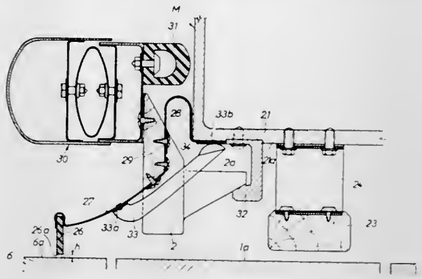
3,578,099

SKIRTING ARRANGEMENTS FOR GROUND-EFFECT MACHINES

Francois Louis Giraud, Plaisir, France, assignor to Societe De L'Aerotrain, Paris, France

Filed Apr. 4, 1969, Ser. No. 813,659
Claims priority, application France, Apr. 5, 1968, 147,271
Int. Cl. B60v *1/16*
U.S. Cl. 180—119 **11 Claims**

The present invention relates to improvements in ground-effect machines of the kind comprising a structure located opposite a bearing surface at a variable distance therefrom, the skirting arrangements which delimit the plenum chamber being associated with means which sense the height of the leakage gap between bearing surface and skirt edge in order to control the raising and lowering of said skirting arrangement as a function of the lowering and raising of the ground-



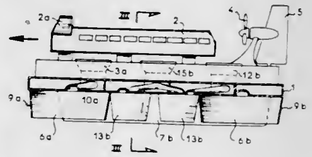
effect machine, the purpose being to prevent premature wear of said skirting edge.

3,578,100

DEVICE FOR CONFINING PRESSURE-FLUID CUSHIONS, MORE PARTICULARLY FOR WATERBORNE GROUND-EFFECT MACHINES

Charles Joseph Marchetti, Neuilly-sur-Seine, and Guy Marcel Neplaz, Meudon-la-Foret, France, assignors to Societe D'Etudes Et De Developpement Des Aeroglisseurs Marins Ferrestres Et Amphibies S.E.D.A.M., Paris, France

Filed Dec. 19, 1968, Ser. No. 785,302
Claims priority, application France, Dec. 22, 1967, 133598
Int. Cl. B60v *1/04*
U.S. Cl. 180—126 **11 Claims**



A pressure-fluid cushion device for a ground-effect machine movable opposite a surface, which device comprises two sidewall structures extending substantially parallel to and on each side of the longitudinal medial plane of the machine and having a front end portion and a rear end portion, the sidewall structures having sufficient rigidity to resist deformation as a result of variable external forces acting on them during displacement of the machine and laterally defining a space between the machine and the said surface, chambers obstructing the space at the front and rear and extending between the sidewall structures, these chambers being bounded by flexible skirts deformable by such external forces, and means for supplying pressure fluid to the chambers and space.

3,578,101

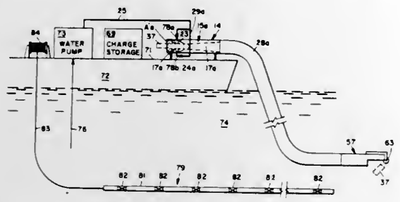
CHARGE LOADER DEVICE, SYSTEM, AND METHOD FOR UNDERWATER SEISMIC EXPLORATION

Richard R. Larson, Ulster Park, N.Y., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of application Ser. No. 818,475, Apr. 21, 1969. This application Nov. 4, 1969, Ser. No. 873,875
Int. Cl. F42d *3/06*
U.S. Cl. 181—.5XC **22 Claims**

A device for loading small explosive charges for delivery to an underwater seismic shooting site over prolonged periods with greater regularity of sequence and higher rate of delivery than possible heretofore is provided which comprises a housing, and an open passageway extending therethrough and including a constricted throat portion and

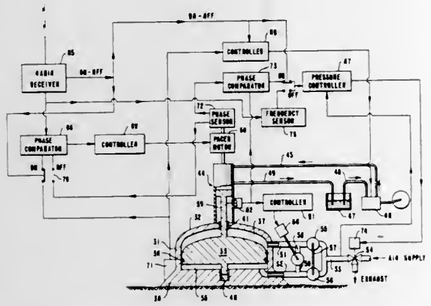
an adjacent frustoconical expansion section together with means for conveying fluid into the throat for generation of Venturi type pressure lowering as the source of suction force for drawing the small charges, inserted into the open



passageway end, through the throat and expansion section for delivery to the site.

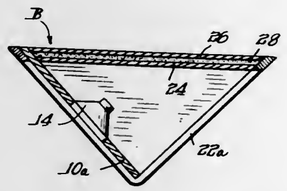
Method and system (1) for such loading of small charges, (2) for firing said charges and (3) for measurement of resulting seismic disturbances for a seismic record, are also provided.

3,578,102
SEISMIC GENERATOR
Frederick W. Ross, Del Mar; Peter Van Horn Serrell, Solana Beach, and Howard L. Shatto, LaJolla, Calif., assignors to Shell Oil Company, New York, N.Y.
Filed Nov. 25, 1968, Ser. No. 778,567
Int. Cl. G01v *1/04, 1/22*
U.S. Cl. 181—0.5 **3 Claims**



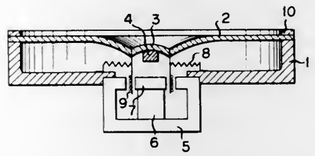
An inertial mass vibratory seismic signal generating system having tunable resonance over the generating frequency range.

3,578,103
SPEAKER ENCLOSURE
John B. Lennes, 35 McCool Road, Portage, Ind.
Filed June 4, 1969, Ser. No. 830,399
Int. Cl. G10k *13/00;* **H04r** *1/28*
U.S. Cl. 181—31 **9 Claims**



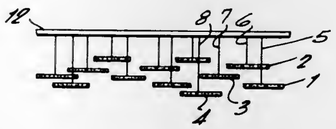
An enclosure for a cone-type loudspeaker and having a mounting wall apertured to receive the speaker with the cone portion extending rearwardly therefrom, and a reflecting wall surface angled rearwardly from one edge of the mounting wall to traverse the space in the rear of the speaker cone and form with the opposite edge of the mounting wall a relatively large opening; the relative angular disposition between the mounting wall and the reflecting wall surface being such that sound vibrations emitted rearwardly from the speaker cone are reflected by the reflecting wall surface to pass freely through the opening in noninterfering relation to the sound vibrations emanating from the front of the speaker, as for example, at about 90° to the axis of the speaker cone.

3,578,104
LOUDSPEAKER
Hiromi Sotome, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Shizuoka-Ken, Japan
Filed May 12, 1969, Ser. No. 823,834
Claims priority, application Japan, May 20, 1968, 43/40931
Int. Cl. G10k *13/00;* **H04r** *7/26*
U.S. Cl. 181—32 **1 Claim**



In a loudspeaker including a cap made of relatively rigid foamed plastics such as foamed polystyrene, an improvement comprising a small piece of rubberlike elastomer having relatively high specific gravity adhered to a central portion of said cap, thereby improving its frequency characteristic especially in a high frequency sound range.

3,578,105
ACOUSTICAL TILE
Allan L. Griff, 70 Riverside Drive, New York, N.Y.
Filed Apr. 22, 1970, Ser. No. 30,919
Int. Cl. E04b *1/86*
U.S. Cl. 181—33 **9 Claims**

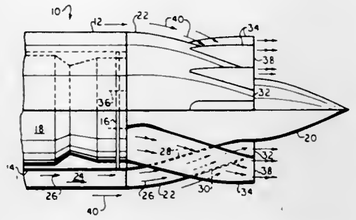


An acoustical tile has a base panel, which may be flat or curved, adapted to be connected with a wall or ceiling, a large plurality of flexible elongated members, and thin planar leaflike resonance members attached at the ends of each of the elongated members. For use on a ceiling, preferably the elongated members are springs or thread or threadlike material and the leaflike resonance members overlap and move separately from each other. For use on a wall, the elongated members are springs.

3,578,106
TURBO-FAN PROPULSION SILENCING APPARATUS
Peter H. Ellis, Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.
Filed Oct. 15, 1969, Ser. No. 866,613
Int. Cl. B64d *33/06*
U.S. Cl. 181—33HC **3 Claims**

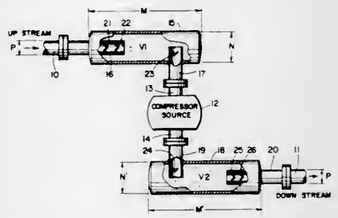
The base of a hollow cone is attached to the aft edge of a turbofan engine enclosed in a tubular housing, the aft portion of the housing being conical and concentrically disposed around the cone so as to provide an annular gap therebetween. Ducts are connected to and circumferentially

spaced about the aft end of the engine casing, these ducts extending rearwardly from the latter and through holes in the cone and housing and their aft ends projecting radially from



the outer surface of the housing so that slipstream air flows therebetween. Engine fan air is discharged through the gap between the cone and the housing, and engine exhaust gas is discharged through the ducts.

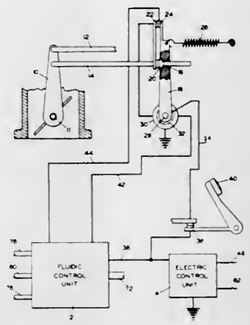
3,578,107
PULSATION DAMPENER USING NON-LINEAR DECOUPLING MEANS
Wilhelm S. Everett, and James K. Floyd, Santa Paula, Calif., assignors to Pulsation Controls Corporation, Santa Paula, Calif.
Filed Mar. 17, 1969, Ser. No. 807,715
Int. Cl. F01n *1/08, 7/02*
U.S. Cl. 181—57 **8 Claims**



A volume chamber having inlet and outlet nozzles adapted for connection in series in a pipe line between a source such as a compressor and a portion of a pipe normally connected to the source is provided for attenuating pressure pulsations in fluid passing through the line and resulting from action of the source such as a compressor. The inlet and outlet nozzles for the volume chamber incorporate nonlinear decoupling means to define partial obstructions to fluid flow into and out of the volume chamber. The acoustic compliance of the chamber and the resistances of the nonlinear decoupling means are so related to each other and to the density and flow rate of the fluid and the fluid displacement and resulting pulsation frequency by the source as to attenuate fluid pulsations in the line. A volume chamber with the inlet and outlet nozzles and nonlinear decoupling means may be incorporated in either the upstream or downstream side of the source or at both locations.

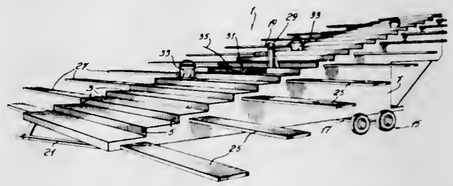
3,578,108
AUTOMOTIVE CRUISE CONTROL SYSTEM HAVING FLUIDIC CONTROL DEVICES
Charles Knapp McConnell, Creve Coeur, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed Feb. 19, 1969, Ser. No. 800,622
Int. Cl. B60k *31/00*
U.S. Cl. 180—106 **11 Claims**

A cruise control system for an automotive vehicle maintains a selected speed. The system has a fluid amplifier control unit which includes a disc rotated by the speedometer and having a pair of openings or gates. A pair of fluid orifices adjacent the disc are angularly adjustable to set the desired speed. When the speed departs from the selected value fluid is supplied through one or the other of the gates and orifices to one side or the other of the fluidic amplifier. The fluid amplifier then operates switching means for a reversible electric motor to increase or decrease the speed of the vehicle. During braking the cruise control system is made inoperative. A



thermal relay, in one embodiment of the invention, produces a time-delay between an overspeed and a closing of the throttle to correct the overspeed, thereby permitting a desired acceleration for a predetermined time. In another embodiment a warning signal device is actuated when the preset speed is exceeded.

3,578,109
APPARATUS FOR PICKING APPLES OR THE LIKE FRUITS
Marcel Gagnon, Frelighsburg, Co. Missisiquoi, Quebec, Canada
Filed Mar. 3, 1969, Ser. No. 803,553
Int. Cl. E04g *1/15*
U.S. Cl. 182—129 **3 Claims**

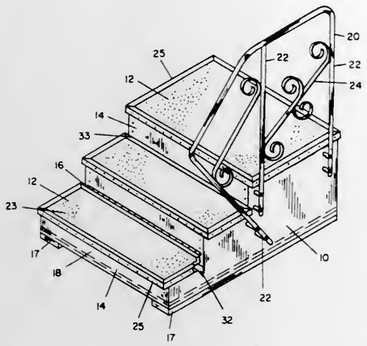


A stairwaylike platform for mechanically harvesting apples or other fruits. It comprises a staircase provided with means for moving the same between rows of apple trees or the like. For this purpose the staircase is mounted on wheels and adapted to be pulled by a tractor. It is also capable of steering. The staircase has retractable steps on either side thereof and these steps are movable between a retracted position inside the staircase and an overhanging position when withdrawn laterally on either side thereof. The retractable steps are operable through any suitable means, which are preferably hydraulic. The staircase may have an inner enclosure for a preliminary classification and loading of apples into boxes.

3,578,110
STEP FOR MOBILE HOMES AND THE LIKE
David Seagraves, 1738 W. 16th St., Mesa, Ariz.
Filed Mar. 20, 1969, Ser. No. 808,835
Int. Cl. E06c *7/00*
U.S. Cl. 182—129 **1 Claim**

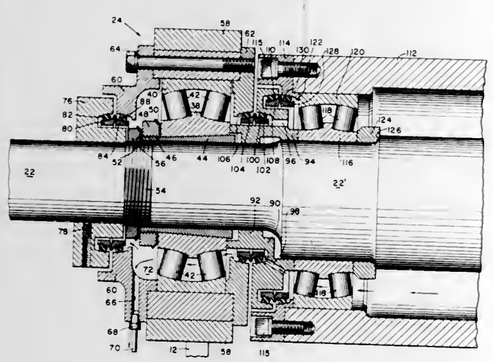
A portable, knock down structure comprising one or more

steps for use as a means to step up into a mobile home or the like. One or more of the treads may be adapted to be easily



opened by hinges or the like so that the interior of the structure may be used as a handy storage space.

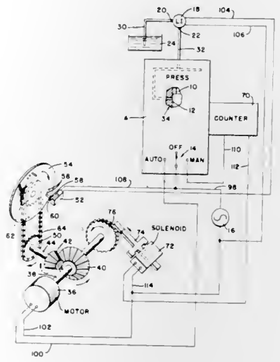
3,578,111
MULTIPLE BEARING RECIRCULATING LUBRICATION SYSTEM
Harold J. Miller, Durand, Mich., assignor to Simplicity Engineering Company, Durand, Mich.
Filed Oct. 18, 1968, Ser. No. 768,804
Int. Cl. F01m *1/12*
U.S. Cl. 184—6 **12 Claims**



A system for lubricating two or more bearing structures which are eccentrically mounted on a common shaft. The system is comprised of structure which enables a fluid lubricant and coolant to be continuously circulated therethrough.

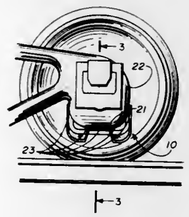
3,578,112
POWER PRESS LUBRICATING SYSTEM
Edward J. Freeland, Hastings, Mich., assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.
Filed Aug. 21, 1969, Ser. No. 852,013
Int. Cl. F01m *9/12*
U.S. Cl. 184—6 **5 Claims**

In a power press of the type having at least two relatively movable components in interfrictional contact at a selected area during relative movement of these components, means for selectively operating the press in one of two modes, and means for lubricating the selected area, the lubricating means including a lubricant injector having an inlet and outlet, the inlet being connected to a supply of lubricant and the outlet being communicated with the selected area. The power press includes an improved lubricating system comprising: first lubrication control means operative when the press is operat-



ing in one of the modes for actuating the lubricant injector; and second lubrication control means operative when the press is operating in the other of the modes for actuating the lubricant injector.

3,578,113
OIL SHIELD FOR RAILROAD JOURNAL BOX
Don A. Dozier, 11141 Joymeadow, Dallas, Tex.
Filed Aug. 8, 1969, Ser. No. 848,662
Int. Cl. F16n *33/00*
U.S. Cl. 184—106 **8 Claims**

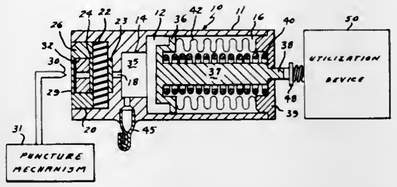


An oil shield for attachment to the jacking pad of a plain or solid type railroad journal box for catching and diverting oil leaking from the journal box away from the wheels and rails to a point toward the edge of the track.

3,578,114
MECHANICAL PNEUMATIC DELAY TIMER
Jay N. Hopps, Minneapolis, Minn., and Norman F. Green, Plymouth Village, Minn., assignors to the United States of America as represented by the Secretary of the Air Force
Filed Jan. 9, 1969, Ser. No. 790,517
Int. Cl. F16f *9/02*
U.S. Cl. 188—311 **1 Claim**

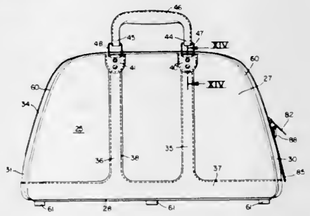
A mechanical pneumatic time delay device has an actuating arm attached to a piston located within a housing. A spring and a bellows for sealing the housing surrounds the actuating arm. A chamber within the housing adjacent the piston is filled with CO_2 under pressure to compress the spring. A porous restrictor is positioned in a passageway in

one wall of the housing. Support discs are provided on both sides of the restrictor. A puncture diaphragm is positioned



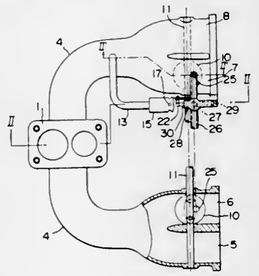
adjacent the restrictor on the side remote from the pressure chamber. Puncture of the diaphragm initiates the time cycle.

3,578,115
UTILITY BAG
Marvin Schneider, Bryn Mawr, Pa., assignor to Rapid-American Corporation, Clayton, Del.
Filed Oct. 21, 1968, Ser. No. 769,313
Int. Cl. A45c *3/00*
U.S. Cl. 190—48 **17 Claims**



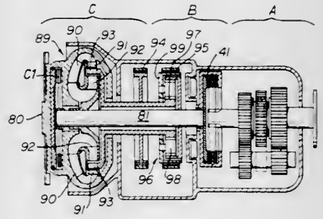
A general utility bag is provided, major components of which are rotationally cast or molded, as an integral monolithic unit, with bottom and closure units being secured thereto by radio frequency heat sealing and wherein other heat sealing operations may be of the radio frequency type. Detail, trim and graining along with simulated stitching is provided as part of the integral molding or casting operation to give the general appearance of a bag constructed of multiple components. Handles are then attached to the bag.

3,578,116
DEVICE FOR SELECTIVE COMBUSTION IN A MULTICYLINDER ENGINE
Yasuo Nakajima, and Yoshimasa Hayashi, Yokohama, Japan, assignors to Nissan Jidsha Kabrishiki Kaisha, Yokohama City, Japan
Filed Nov. 13, 1968, Ser. No. 775,239
Claims priority, application Japan, Jan. 25, 1968, 43/3986
Int. Cl. F16d *21/04*; **F02d** *9/00*
U.S. Cl. 192—.062 **7 Claims**



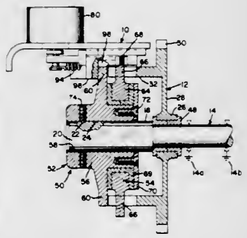
A device for saving fuel and cleansing exhaust gas in a multicylinder automobile engine, by interrupting fuel supply to selected cylinders of the engine during deceleration and coasting of the automobile. The device comprises valves mounted in the selected cylinders of the engine, a pressure-sensing means to sense the negative pressure at the intake manifold of the engine, and a connecting means to operatively connect said pressure-sensing means to said valves. The valves are closed by the pressure-sensing means when the negative pressure at the engine intake manifold exceeds a certain predetermined level due to deceleration or slow running of the automobile.

3,578,117
VEHICLE TRANSMISSIONS
Karl Gustav Ahlen, Stockholm K, Sweden, assignor to S. R. M. Hydromekanik, AB, Sweden
Filed Dec. 6, 1968, Ser. No. 781,855
Claims priority, application England, Dec. 11, 1967, 56293
Int. Cl. F16h *37/00, 47/08, 67/00*
U.S. Cl. 192—3.51 **23 Claims**



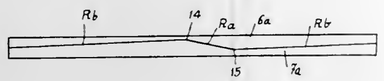
A transmission for vehicles including a hydrodynamic torque converter wherein the torque multiplication range of the torque converter is increased by a power shift gear device having a release clutch interposed between input and output of the shift gear. The output side of the shift gear is connected to a synchromesh gear transmission, the arrangement being such that the shift gear the release clutch and the synchromesh gear can be connected in series.

3,578,118
CAM OPERATED POSITIVE CLUTCH AND BRAKE
Lewis K. Wetzel, South Burlington, Vt., assignor to General Electric Company
Filed Oct. 1, 1969, Ser. No. 862,656
Int. Cl. F16d *67/02*
U.S. Cl. 192—16 **9 Claims**



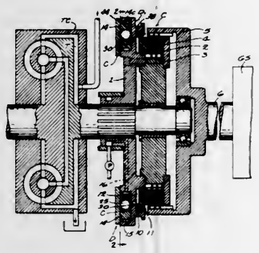
A clutch and brake mechanism includes a constantly rotating drive gear mounted for rotation about the driven shaft. A clutch hub is keyed to the shaft for rotation therewith and axial movement thereon, and has a lug which is to be engaged with either the drive gear or a stationary stop. A guide vane is mounted on the hub for axial movement therewith and rotation thereon, and is keyed to the drive gear for rotation therewith and axial movement thereon. The vane has a lug with a constantly rotating knife or cam blade. A non-rotatable control knife or cam blade is translated between the vane and the gear or the vane and the stationary stop to cam the vane directly and thereby shift the hub lug into engagement with either the gear or the stop.

3,578,119
MULTIDISC CLUTCHES
Jean G. M. Auriol, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt, France
Filed May 14, 1969, Ser. No. 824,428
Claims priority, application France, May 22, 1968, 152779
Int. Cl. F16d *13/38, 69/00*
U.S. Cl. 192—70.14 **2 Claims**



Clutch mechanisms comprising a plurality of axially movable discs alternatively rotatably solid with two concentric members, wherein a thrust element coacts with the pressure plate of the discs, characterized in that the registering faces of two adjacent discs are formed with cooperating surface portions concentric to the disc axis but not parallel to the opposite face of the same disc.

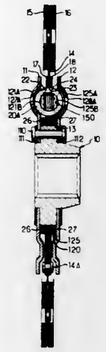
3,578,120
TORQUE TRANSMISSION HAVING ACCELERATION RESPONSIVE FLUID CONTROL MEANS
Conrad R. Hilpert, Winnebago, Ill., assignor to Twin Disc Incorporated, Racine, Wis.
Filed Aug. 11, 1969, Ser. No. 849,048
Int. Cl. F16d *43/24, 43/284*
U.S. Cl. 192—103C **11 Claims**



Power transmitting devices, such as friction clutches including disengageable friction plates, and having means for sensing the deceleration or acceleration of relatively moving parts and which can be utilized to control the slippable friction clutch and thereby limit the torque peaks transmitted by the clutch and aid in control of input or output speed.

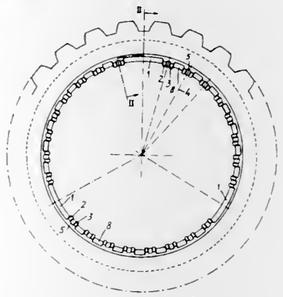
3,578,121
FRICTION DISC WITH TORSIONAL DAMPENER
Jean Maurice, Paris, France, assignor to Societe Anonyme Francaise Du Ferodo, Paris, France
Filed Apr. 7, 1969, Ser. No. 814,047
Claims priority, application France, Apr. 9, 1968, PU147,428
Int. Cl. F16d *47/02, 3/14*
U.S. Cl. 192—106.2 **19 Claims**

In a clutch friction-unit of the kind comprising a friction disc mounted between two annular plates fixed to each other and coupled to said annular plates by elastic means, the retention in position of the elastic means is ensured by pressed-



out portions, formed alternately as dished portions and relief portions in said annular plates.

3,578,122
GROOVED SINTERED METAL SYNCHROMESH RING
Roger Magnier, Billancourt, France, assignor to Regie Nationale des Usines Renault and Automobiles Peugeot, Paris, France
Filed Mar. 5, 1969, Ser. No. 806,778
Int. Cl. F16d *13/66, 13/72*
U.S. Cl. 192—107 **5 Claims**

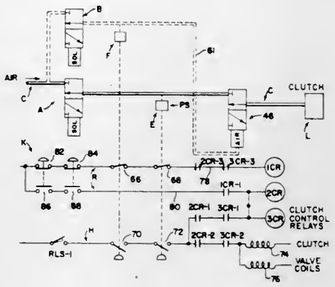


Splined synchromesh ring of sintered metal for transmission mechanism wherein relatively narrow splines are disposed in the direction of the generatrices of the inner tapered surface, characterized in that said nonmachined splines are compression-calibrated and arranged by groups, and that a relatively shallow depression is provided between two adjacent splines of the same group.

3,578,123
DUAL CLUTCH VALVE INTERLOCKING
Edward J. Freeland, Hastings, Mich., assignor to Gulf & Western Industries Products Company, Grand Rapids, Mich.
Filed Apr. 17, 1969, Ser. No. 817,101
Int. Cl. F16p *3/18*
U.S. Cl. 192—131 **11 Claims**

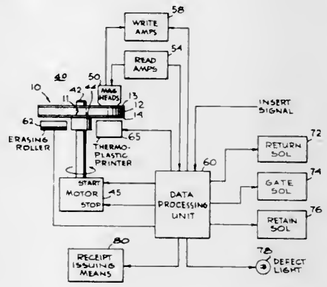
An improved pneumatic-electrical interlocking arrangement for presses comprising an electrical run circuit; a pair of contacts in series in said run circuit; a pneumatic clutch circuit including dual solenoid actuated poppet valves arranged so that if one of said valves should fail the other valve

prevents the inadvertent flow of air in said pneumatic circuit; the solenoids of said poppet valves being connected in said run circuit; and switch means responsive to the positions of



said poppet valves actuating said contacts, said switch means being of the class consisting of pressure switches and proximity switches.

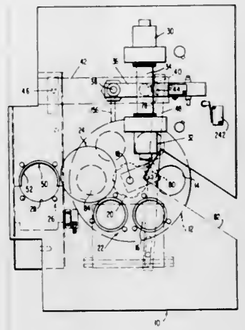
3,578,124
AUTOMATIC FARE COLLECTING SYSTEM
Herman H. Flum, London, England, assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.
Filed Apr. 24, 1969, Ser. No. 818,987
Int. Cl. G07f *1/06*
U.S. Cl. 194—4R **22 Claims**



An automatic fare collection system for collecting fares or other charges from customers using specially constructed passes. The pass comprises a flat circular or rectangular member on which data can be recorded in magnetic form on one side of the pass, and in erasable humanly readable form on the other side of the pass. At the time of purchase, appropriate data is recorded on the pass in both magnetic and erasable humanly readable form, and both forms of data are updated each time the pass is used.

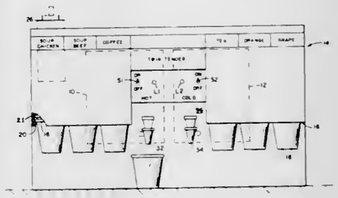
3,578,125
COFFEE-MAKING AND VENDING MACHINE
Jose Marlet Barrera, Paseo Valldoreie, 6, San Cugat Del Valles, Spain
Filed Apr. 1, 1969, Ser. No. 811,909
Claims priority, application Spain, Mar. 30, 1968, 352,219
Int. Cl. G07f *13/00*
U.S. Cl. 194—13 **8 Claims**

A coffee-making and vending machine, comprising a motor pump, motors including reciprocating pistons, a boiler with heating element and a thermostat, a distributor group for cups, spoons and sugar, a group for the charging of a measured amount of coffee in a cartridge and discharge of the spent coffee cartridge, a coin selector and an electric circuit including a circuit for the actuating and synchronized stopping of said mechanical parts until completion of the phase of one cycle and control circuit for preventing the flow



of electricity to the former in the event that prerequisite conditions for the automatic operation of the assembly are not present.

3,578,126
HOT AND COLD LIQUID DISPENSER WITH FRAUD ALARM
David M. Adams, Huntsville, Ala., assignor to Conzinc Riotinto of Australia Limited, Melbourne, Victoria, Australia
Filed Feb. 27, 1969, Ser. No. 803,489
Int. Cl. G07f *9/02*
U.S. Cl. 194—16 **6 Claims**

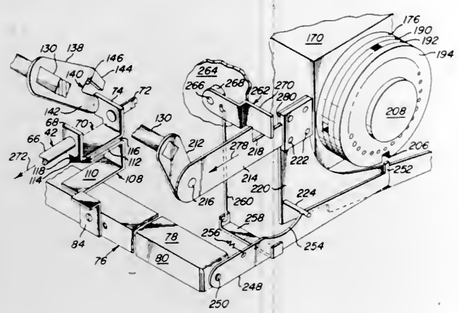


A hot and cold liquid dispensing machine wherein cups containing dry concentrate packets are stored prior to use and in which a desired drink is then made by selectively applying hot or cold water to the concentrate. Hot or cold water is provided by heating and cooling tank assemblies through separate spigots which are linked to a coin box and alarm system and wherein an alarm is sounded if a coin(s) is not deposited each time each spigot is operated to insure that drinks are paid for.

3,578,127
VENDING MACHINE WITH ADJUSTABLE PRICE SETTING
Henry Verbeke, Chester, N.J., assignor to Universal Vendors, Inc., Philadelphia, Pa.
Filed Jan. 8, 1969, Ser. No. 789,738
Int. Cl. G07f *11/00*
U.S. Cl. 194—71 **27 Claims**

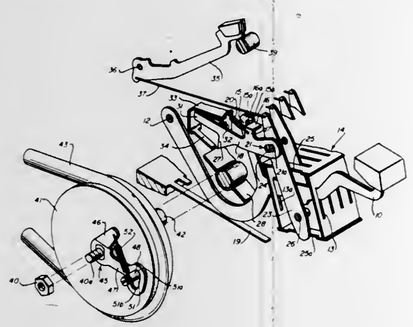
A vending machine adapted to dispense commodities at different prices while utilizing a single coin slot for the insertion of money. A plurality of plungers is provided, with each plunger adapted to dispense a commodity from an associated magazine. A totalizer is provided for mechanically recording and indicating the total amount of money deposited in the coin slot. Upon operation of any given plunger, a feeler is brought into contact with an adjustable indicator associated with the totalizer whereby the feeler will sense whether the correct amount of money needed to operate the given

plunger has been deposited in the vending machine and recorded on the totalizer. If the correct amount of money has



been inserted, a latch will be released and the plunger will be permitted to continue a full stroke operation, thereby dispensing a commodity from its associated magazine.

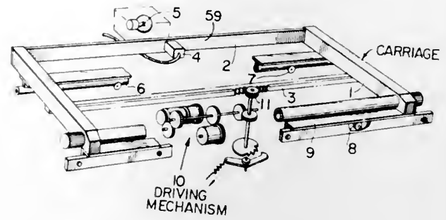
3,578,128
TYPE ACTION HAVING LOST MOTION
Kenneth R. Frechette, and Daniel J. Rosborg, Bristol, Conn., assignors to Litton Business Systems, Inc., New York, N.Y.
Filed Oct. 8, 1968, Ser. No. 765,755
Int. Cl. B41j *23/06*
U.S. Cl. 197—17 **2 Claims**



An efficient type action for an electric typewriter characterized by an economy of parts, having a pawl adapted to be pulled into the tooth of a snatch roll by key lever depression, which is coupled to a type bar sublever by a lost motion pin and slot connection. The action is also associated with a resilient energy storing and controlled motion transmitting connection between a power source and the snatch roll.

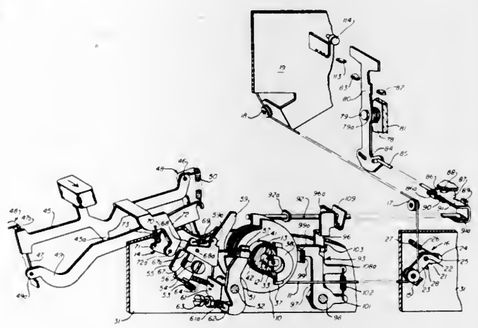
3,578,129
CONTROL DEVICE FOR POSITIONING CARRIAGES OF BUSINESS MACHINES
Yoshiaki Kato, and Hideya Watanabe, Kamakura-shi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha
Filed July 22, 1968, Ser. No. 746,406
Claims priority, application Japan, Aug. 30, 1967, 55675/67
Int. Cl. B41j *5/30*
U.S. Cl. 197—19 **6 Claims**

A control device for positioning a carriage of a business machine such as an accounting machine or a typewriter comprises means to detect the present position of the carriage, means to compare a signal produced by the detecting means with a position signal representing a predetermined carriage position a driving means driven by a command signal to drive the carriage, means driven by a command signal to fixedly locate the carriage, a braking means driven by a command signal to apply a braking force to the carriage and a control



means to generate said position signal and to selectively send a control signal to respective ones of said detecting means, comparing means, driving means, locating means and braking means, to locate the carriage in a desired final position.

3,578,130
CARRIAGE RETURN ENERGY ABSORBER
Kenneth R. Frechette, Bristol, Conn., assignor to Litton Business Systems, Inc., New York, N.Y.
Filed Feb. 17, 1969, Ser. No. 799,568
Int. Cl. B41j *19/02, 19/68*
U.S. Cl. 197—64 **3 Claims**

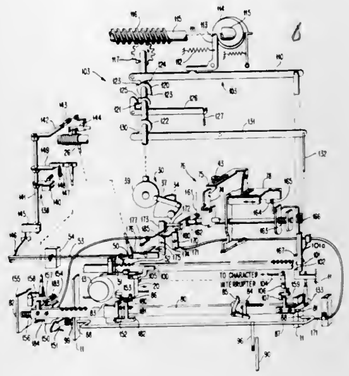


A carriage return drawband load cushioning device having a carriage return drawband guide supported on a pivotally mounted bell crank, the position of which is determined by a spring adapted to yield in response to carriage load at the commencement of carriage return movement and revert to a normal condition only after the termination of carriage return movement.

3,578,131
TYPEWRITER WITH EXTENDED WRITING LINE
William A. Heidt; Leon E. Palmer, and John O. Schaefer, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 8, 1968, Ser. No. 774,276
Int. Cl. B41j *19/00*
U.S. Cl. 197—82 **5 Claims**

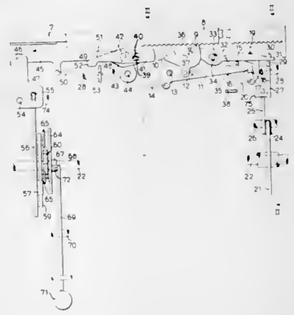
The writing line of a typewriter is extended by combining movements of the paper and of a type element carrier. Incremental letter feed is accomplished by movement of the type element carrier along a writing line past the paper which is normally stationary. Upon reaching an advanced position, the type element carrier is restored in the reverse direction and the paper is advanced to present the next letter space to the type element in its restored position. Continued typing advances the type element carrier incrementally to the end of

the writing line. Operation of a line-return key restores the carrier directly to a new line left-hand margin position, in-



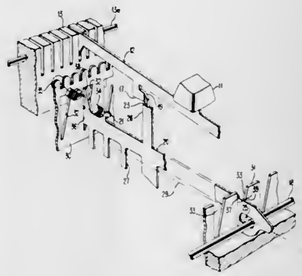
dexes the paper to a new line and restores the paper to its original beginning-of-line position.

3,578,132
HALF-SPACE CARRIAGE RETURN MECHANISM FOR TYPEWRITERS
Venanzio Micheletti Cremasco, Banchette, and Domenico Roano, Parella, Italy, assignors to Ing. C. Olivetti & C. S. P. A., Ivrea (Torino), Italy
Filed Feb. 2, 1968, Ser. No. 702,568
Claims priority, application Italy, Feb. 6, 1967, 50454/67
Int. Cl. B41j *19/62*
U.S. Cl. 197—91 **4 Claims**



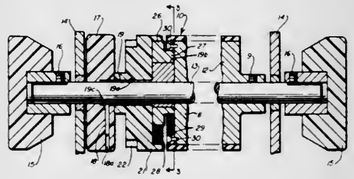
A half-space carriage return mechanism for typewriters, having a rack secured to the carriage and normally engaged by an escapement dog adapted to be disengaged momentarily from the rack to letter space the carriage, comprises a pawl movable in a first direction to engage the rack and to return the carriage half a space, and means actuatable for momentarily disengaging the pawl from the rack simultaneously with disengagement of the escapement dog when and only when the pawl is in the position in which it has backspaced the carriage through half a space, to cause said carriage to be advanced offset half a space with respect to normal letter spaced positions.

3,578,133
NONREPEAT MECHANISM FOR KEYBOARD
John O. Schaefer, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 15, 1969, Ser. No. 791,420
Int. Cl. B41j *5/08*
U.S. Cl. 197—98 **11 Claims**



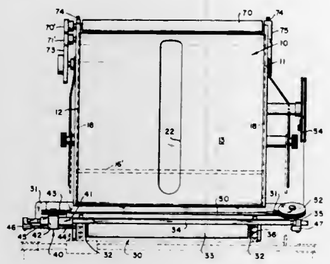
An encoding keyboard having individual reciprocal key-selected interposers, is constructed to eliminate the usual nonrepeat linkage while retaining the nonrepeat function. Each interposer is yieldably guided for movement within a plane, but is permitted limited lateral movement out of the plane to accomplish the nonrepeat function. Each keylever is provided with a laterally inclined cam portion. An operating interposer restores past a "still depressed" key by tilting laterally and thereby prevents an undesired second selection of the same interposer.

3,578,134
FINE ADJUSTMENT MEANS FOR INCREMENTAL FEED MECHANISMS
Ralph L. Parker, Rockville, Conn., assignor to Litton Business Systems, Inc., New York, N.Y.
Filed Oct. 16, 1968, Ser. No. 768,006
Int. Cl. B41j *19/76*
U.S. Cl. 197—114 **5 Claims**



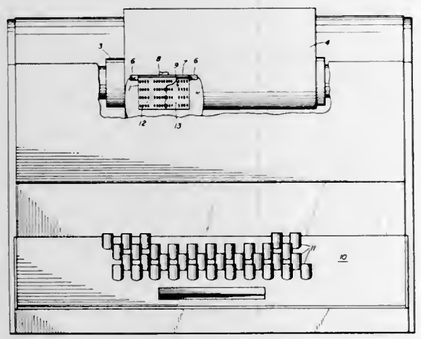
An incremental feed mechanism having a fine or incremental feed control wheel is connected in driving relationship with a drive transmitting hub which is rotatably mounted on a typewriter platen shaft. The hub is formed to provide an eccentric surface for rotatably supporting and transmitting rotary movement to a pair of integrally formed or connected axially spaced spur gears adapted to engage a first inner ring gear formed in a normally stationary line feed indexing ratchet and a second inner ring gear secured to a cylindrical typewriter platen, to thereby drive the cylindrical typewriter platen through minute and irregular arcs proportional to rotary movement of the incremental feed control wheel.

3,578,135
WEB SEVERING AND EJECTION DEVICE
Walter H. Husing, Walnut Creek, Calif., assignor to Shell Oil Company, New York, N.Y.
Filed July 23, 1968, Ser. No. 746,888
Int. Cl. B41j *15/00*
U.S. Cl. 197—133 **3 Claims**



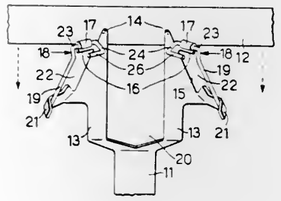
An apparatus for detaching or separating completed multiply copy printed forms as they are discharged from an automatic printing or billing machine. The apparatus includes a main frame for supporting the printed forms and to which is attached a tension-applying pair of rollers at one end and a carriage at the other. The carriage moves transversely across the main frame and severs the printed forms by pulling a cutting line therethrough as it moves across the main frame. The operation of the apparatus is synchronized with the operation of the printing machine and will route the detached form to a designated location.

3,578,136
TYPEWRITER PRINTING MEANS FOR SYMBOLS IN CODED INKS
Robert H. Postal, Clifton, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed Sept. 11, 1969, Ser. No. 856,959
Int. Cl. B41j *33/14, 31/05, 35/04*
U.S. Cl. 197—151 **6 Claims**



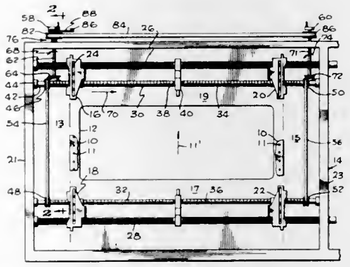
Symbols in coded inks in which the code in the presence or absence of photoluminescent constituents is effected on a modified teletypewriter mechanism by clipping onto the back of a standard teletypewriter type head a portion of ribbon with separate areas registering with the type heads, each area being impregnated with a coded ink having the proper presence or absence of coded photoluminescent components corresponding to the symbol of the type head. The areas are separated from each other somewhat, as is always the case with the teletypewriter head, and so contamination of the coded ink impregnated in one area with that in another area cannot take place. The teletypewriter head is provided with a clip frame and the inked ribbon portions are in suitable disposable frames which slide into the clip and are self-registering.

3,578,137
DEVICE FOR GUIDING A RIBBON IN A TYPEWRITER OR SIMILAR MACHINE
Rinaldo Salto, Ivrea, Turin, Italy, assignor to Ing. C. Olivetti & C.S.P.A., Ivrea, Turin, Italy
Filed Sept. 26, 1968, Ser. No. 762,788
Claims priority, application Italy, Oct. 12, 1967, 53320-A/67
Int. Cl. B41j *35/04*
U.S. Cl. 197—170 **9 Claims**



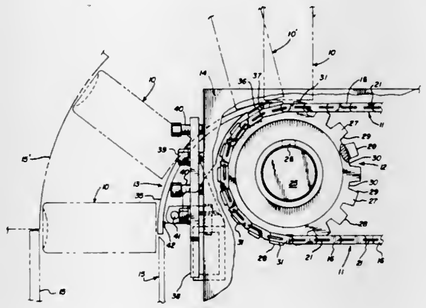
A ribbon vibrator body carries in association with each of two opposite lateral recesses an arm to provide therewith normally two closed ribbon guiding eyes. Said arms are pivotally carried on said body above said recesses for forward swinging movement from closed eye to open eye positions but are under bias to closed eye positions. The arrangement is such that if a ribbon is lowered behind said body at said recesses and then at each side of the body is drawn forwardly, said arms will first yield out of the way of the ribbon and thus will open said eyes to receive the ribbon and then will by the seated bias move to closed eye positions to entrap the ribbon.

3,578,138
PAPER ADJUSTING MECHANISM
Gill Cantwell, Los Angeles, Calif., assignor to Data Products Corporation, Culver City, Calif.
Filed July 18, 1968, Ser. No. 745,796
Int. Cl. B41j *15/16;* **G03b** *1/30*
U.S. Cl. 197—133 **1 Claim**



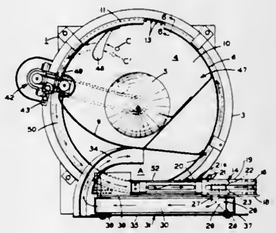
Apparatus for use with a high speed printer which has four tractors that engage sprocket holes in the paper, to adjust for different paper widths or to adjust the lateral position of the paper. The apparatus comprises a pair of lead screws on each side of the printer, each lead screw coupled to one tractor. A pair of timing belts couple together the two lead screws on each side of the printer so that the tractors on each side move laterally together. A handwheel on the printer can be engaged either with only one belt to laterally move only the pair of tractors on one side of the printer, or with both belts to move all four tractors together.

3,578,139
ARTICLE HANDLING MACHINE UNLOADING MECHANISM
Ronald A. Pearce, Jefferson City, Colo., assignor to Coors Porcelain Company, Golden, Colo.
Filed Sept. 8, 1969, Ser. No. 856,091
Int. Cl. B65g *47/74*
U.S. Cl. 198—28 **13 Claims**



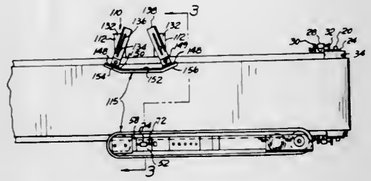
Article handling and unloading mechanism comprising a traveling endless belt having an article supporting surface on which articles are carried to an unloading position, a rotating roller having means thereon for engaging the belt and extending through openings in the belt to project beyond the article carrying surface and to constitute lifting surfaces for lifting articles from the supporting surface when the belt approaches unloading position and transfer them to an article receiving curved plate which is pivotally mounted adjacent the unloading position of the belt for automatically assuming an article receiving position overlying the unloading area of the belt.

3,578,140
CLOSURE FEEDING APPARATUS
Caleb H. Myer, Columbia, and Gregory L. Nicklaus, Lancaster, Pa., assignors to Kerr Glass Manufacturing Corporation, Los Angeles, Calif.
Filed Sept. 16, 1968, Ser. No. 759,847
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 **8 Claims**



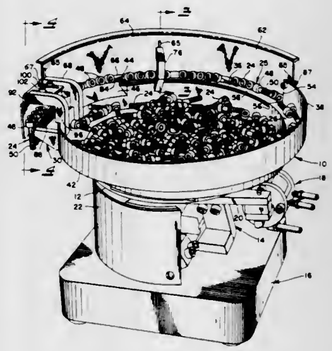
Apparatus for feeding and orienting closure caps. Caps in random arrangement on a rotary disc are centrifugally forced to the periphery thereof where they are plowed off into a single layer. Small magnets in the periphery of the disc hold the outermost row of caps which are fed into a discharge chute in single file. Selector means in the discharge chute allow passage of properly oriented caps and discharges the remainder to an orienting means attached to an opening in the chute directly below the selector means. The orienting means turns the caps and passes them to a magnetic conveyor belt which discharges them, properly oriented, onto the periphery of the rotary disc from which they are again fed into the discharge chute.

3,578,141
FILLED BAG SHIFTING DEVICE WITH BAG TURNER
Robert T. Sheehan, 31530 Myrna Road, Livonia, Mich.
Filed Sept. 20, 1968, Ser. No. 761,053
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 **3 Claims**



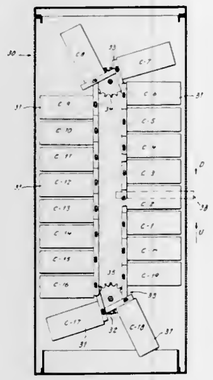
Pivotally mounted above the framework of a power-driven horizontal endless belt conveyor is a power-driven vertical endless belt bag shifting device adapted to be swung over the horizontal belt conveyor for engagement with filled bags proceeding therealong. Such engagement causes the bag shifting belt to carry the bags across the horizontal conveyor to a discharge ramp or other points of disposal or further transfer. Where it is desired to turn vertically standing bags around their vertical axes as they proceed along the horizontal conveyor, a bag turner is mounted above and on the opposite side of the horizontal conveyor from the vertical bag shifting belt device, the ribbed or otherwise roughened surface of which acts as a fulcrum engaging and retarding the forward travel of one side of the bag while the endless vertical bag shifting belt swings the other side of the bag in a forward direction so as to turn the bag through an angle of approximately 90°.

3,578,142
TOOLING FOR VIBRATABLE BOWL
Warren C. Burgess, Jr., Avon Lake, Ohio, assignor to Burgess & Associates, Inc., Lakewood, Ohio
Filed Mar. 5, 1969, Ser. No. 804,477
Int. Cl. B65g *47/24*
U.S. Cl. 198—33AA **1 Claim**



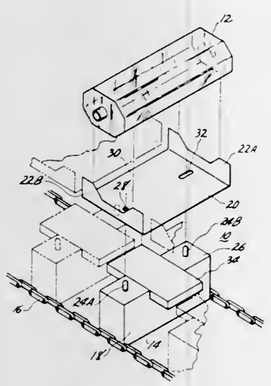
There is provided, for use with a vibratable bowl adapted to feed parts from a supply of randomly disposed parts in said bowl, such parts being similarly geometrically configured and having an enlarged portion, e.g. a headed bolt, means coacting with a track portion of said bowl characterized by adjustability in an axial direction to define an axially adjustable slot adapted to receive a narrower portion of the part and to retain the enlarged portion and to guide the parts to a discharge gate which is characterized by adjustability in a radial direction. Thus, the bowl is adjustable to accommodate parts of varying sizes.

3,578,143
CONTROL SYSTEM
Benjamin W. Woodward, Kenmore, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Aug. 22, 1969, Ser. No. 852,232
Int. Cl. B65g *43/00*
U.S. Cl. 198—40 **9 Claims**



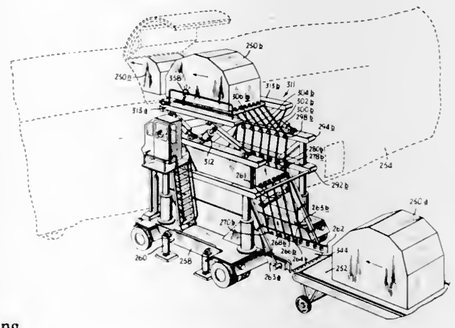
A system for automatically controlling mechanized filing equipment including a conveyor for moving one or more article carriers along a predetermined path. Selective carrier positioning for access at a work station is effected by entering appropriate input commands. Corresponding control signals are accordingly initiated that ultimately determine the interval during which the conveyor drive is operative. To this end, coarse and fine control arrangements are interrelated to energize motor drive circuitry and achieve accurate carrier positioning.

3,578,144
CONVEYING ARTICLES
John M. Punzak, West Hartford, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Feb. 26, 1969, Ser. No. 802,540
Int. Cl. B65g *17/46*
U.S. Cl. 198—41 **2 Claims**



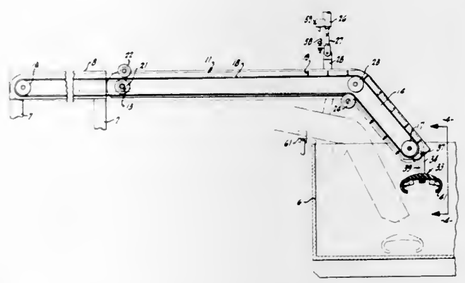
In a system for transporting articles, such as packaging containers, between work stations by means of an endless conveyor having spaced supports thereon and holders for the articles mounted either directly on the conveyor or on the supports attached to the conveyor, the improvement of utilizing permanent magnets for securing the holders in a readily releasable manner. A method is provided which requires that the magnetic field be sufficient to resist gravity separation but insufficient to prevent manual separation of the holders from their supports.

3,578,145
TRANSPORT DEVICE
Guenther L. Kuehl, Peekskill, N.Y., assignor to Guenther Systems, Inc., Buchanan, N.Y.
Filed Feb. 11, 1969, Ser. No. 798,366
Int. Cl. B65g *21/12, 67/00*
U.S. Cl. 198—115 **8 Claims**



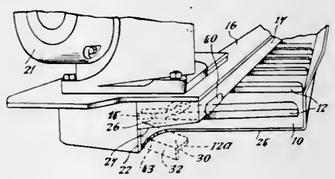
In the several embodiments of the invention described herein, an adjustable transport device is provided which includes a multiple chain drive system for transporting unit loads of material between a number of vertically and laterally displaced locations. In one embodiment, the device is provided as a truck attachment, and in a second embodiment, the vertical lift is permanently installed in a truck dock. In the third embodiment, a transport device for aircraft and the like carriers is provided with self-adjusting features and a unique platform construction. In a fourth embodiment, a transport device provides perpetual motion bridging for transporting people or material across obstacles and in the fifth and sixth embodiments, telescoping transport devices are provided. In a seventh embodiment, an inverted transport system is provided for transporting unit loads of material between at least three locations.

3,578,146
FILLER FOR BINS
James J. Mehlschau, Davis, Calif., assignor to The Regents of the University of California, Berkely, Calif.
Filed Oct. 14, 1968, Ser. No. 767,073
Int. Cl. B65g *65/30*
U.S. Cl. 198—121 **6 Claims**



A filler for bins has a supply conveyor with a stationary initial portion and an end portion movable on said stationary portion to lift and lower in a bin in response to a jack controlled by either of two sensing panels on the margins of a deflector frame, hanging as a pendulum from said conveyor end portion, to lift said end portion when one of said sensing panels is abutted by produce in said bin.

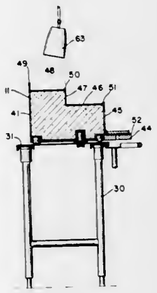
3,578,147
CHAIN CONVEYOR
Robert Benjamin Bolton, 14, Middle Drive, Ponteland, Northumberland, England
Filed Jan. 28, 1969, Ser. No. 794,549
Claims priority, application Great Britain, Jan. 31, 1968, 5002/68
Int. Cl. B65g *45/00*
U.S. Cl. 198—171 **6 Claims**



Improvements in chain conveyors of the type comprising a trough to receive the materials being conveyed, and endless chain to one side of the trough extending therealong between end sprockets, a series of flights spaced along and below the chain and pivotally attached at one end to the chain, there being means adapted to maintain the flights transversely to the trough throughout the driving run of the chain whereby the working parts of the flights cause the materials to flow along the trough and further adapted to cause or permit rotation of the flights about their pivots at the completion of each driving run so that they assume a trailing attitude relative to their pivots during the return run.

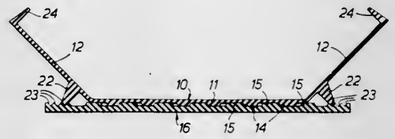
The improvements include the provision of a scraper edge arranged at the discharge end of the conveyor so as to closely overlie the flat upper surface of each oncoming flight in a region adjacent its pivot. The flights are withdrawn underneath the scraper edge so that the flat upper surface of each flight passes progressively beneath the scraper edge from said region adjacent the pivot point to the end remote from the pivot.

3,578,148
TRAY AND CONVEYOR ASSEMBLY
Charles P. Pinckard, 1301 E. Morehead St. Suite 15, Charlotte, N.C.
Filed Jan. 27, 1969, Ser. No. 794,302
Int. Cl. B65g *15/00*
U.S. Cl. 198—181 **10 Claims**



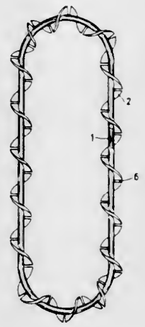
A multitiered conveyor tray for facilitating serving tray assembly having a base, side and end walls for retaining articles on each tier level for travel along a directed path of travel on a conveyor to expose selected tiers to various treatment.

3,578,149
BELT CONVEYORS
Charles Thomson, Wokingham, England, assignor to Solar Thomson Engineering Company Limited, Surrey, England
Filed Dec. 1, 1969, Ser. No. 876,201
Claims priority, application Great Britain, Oct. 12, 1967, 16885/67
Int. Cl. B65g *15/62*
U.S. Cl. 198—201 **4 Claims**



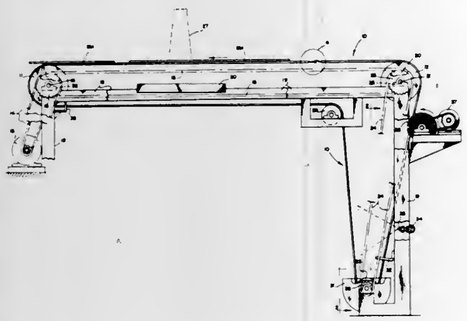
A belt conveyor having an endless carrier belt, and endless drive belt in frictional driving engagement with the inner surface of the carrier belt, and support means traveling with the carrier belt, and support along the load carrying flight thereof for supporting the carrier belt in a troughed configuration.

3,578,150
CONVEYING MEMBER FOR INCOHERENT OR POWDERY MATERIALS, ESPECIALLY FOOD FOR POULTRY OR LIKE ANIMALS, AND DEVICE FOR THE MANUFACTURE THEREOF
Camillo Pirovano, Via Monza, 51, Cernusco Lombardone, (Como), and Costante Radaelli, Via Ardigo, 38, Monza, (Milan), Italy
Filed Apr. 22, 1968, Ser. No. 723,199
Claims priority, application Italy, Apr. 22, 1967, Apr. 9, 1968, 15289A/67;15001A/68
Int. Cl. B65g *33/00*
U.S. Cl. 198—213 **6 Claims**



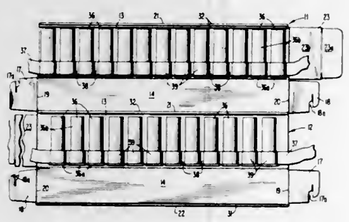
A conveying member for dispensing food to poultry and like animals is disclosed, which comprises a flexible core made by a steel rope and a helical sheath applied to the exterior of said rope by concurrent extrusion of a thermoplastic material. The helical sheath may comprise a single helix or a plural helix, the helical web being possibly interrupted by notches in order to improve the flexibility. The conveying member is used by placing it, in closed loop, within a tubular casing which is properly perforated at the dispensing points to feed the underlying troughs.

3,578,151
SHEET CONVEYOR SYSTEM
John H. Crawford, Corvallis, Oreg., assignor to Leading Plywood, Corvallis, Oreg.
Filed Nov. 29, 1968, Ser. No. 780,061
Int. Cl. B65g *45/00*
U.S. Cl. 198—230 **3 Claims**



A conveyor system is disclosed for the transfer of sheet material. The traveling components comprise a multitude of replaceable elastic members each identically entrained about powered roller means. The system presently disclosed is adapted for conveying sheet material which is to be treated while being conveyed with additional structure being disclosed for cleaning of the elastic conveyor components. Toward this end a rinse is provided for the conveyor components along with means for removing water particles from said components prior to their again receiving delivered sheet material to be treated.

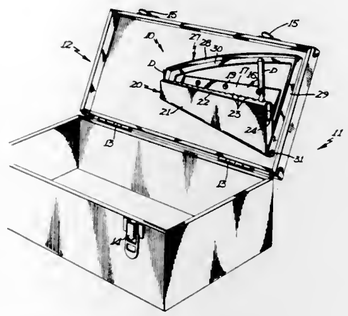
3,578,152
SHELL CARTON
Daniel W. Hartley, 1820 Bexley St., North Charleston, S.C.
Filed July 2, 1969, Ser. No. 838,510
Int. Cl. F42b *39/00*
U.S. Cl. 206—3 **10 Claims**



A carton for packaging articles such as shells for shotguns comprising a pair of complementary half sections of plastic material detachably interconnected to form a carton with a plurality of shells removably supported on each half section and with tie straps on the ends of each half section for tying a detached half section around a wearer's waist thereby exposing the shells for convenient access and removal by the wearer.

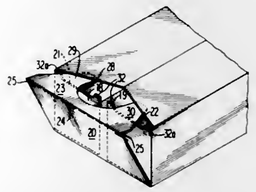
3,578,153
DRILL HOLDER DEVICE
John L. Olson, 1300 Birch St., North Branch, Minn. 55056
Filed Aug. 7, 1969, Ser. No. 848,305
Int. Cl. A45c *11/26*
U.S. Cl. 206—17 **6 Claims**

A drill holder device includes a bracket which is attachable to the inside surface of the cover of a tool box. A drill container is pivoted to the bracket and the container has a plurality of openings therein, each opening receiving a different size drill therein. Each drill projects exteriorly from the container, and a retainer is pivotally mounted on the drill container and prevents the drills from falling from the container when the tool box cover is closed. However, the drill con-



tainer will swing away from the retainer when the tool box cover is in the fully open position, thereby permitting ready removal and replacement of the drills with respect to the container.

3,578,154
SHADOW BOX WITH LOCKING DUST FLAPS
Homer Martelli, Westwood, N.J., assignor to Union Camp Corporation, New York, N.Y.
Filed Apr. 7, 1969, Ser. No. 813,842
Int. Cl. B65d *5/50, 5/10*
U.S. Cl. 206—45.14 **1 Claim**

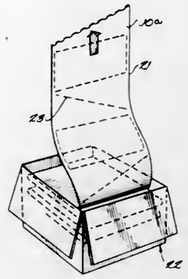


A carton is formed from a precut and prescored blank to provide a hollow body having front and rear panels joined by side panels, and ends closed by interlocking flap means. One end, usually the top, is closed by two infolded dust flaps and an overlying tuck-in flap means. Each of the dust flaps has a recess cut into the edge facing the front panel so as to form inner and outer tabs along that edge. The tuck-in portion of the overlying flap has a recess or opening cut into it to provide two tab formations. When the flaps are infolded to close the carton, each of the tab formations on the tuck-in portion fits into the recess of its associated dust flap. A locking slit is formed at each end of the score line which hinges the tuck-in portion of the overlying flap, which slits interlock with the outer tab on each of the dust flaps upon full insertion of the tuck-in portion. The erected carton may be converted into a shadow box for displaying the merchandise by separating the front panel into two portions and folding such portions and the top locked flap means inwardly, whereby a mitered frame effect is formed in back of the displayed merchandise.

3,578,155
DISPOSABLE PRODUCT
Rudolph E. Small, and John J. Bradley, Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.
Filed Feb. 24, 1969, Ser. No. 801,407
Int. Cl. B65d *85/67*
U.S. Cl. 206—56 **4 Claims**

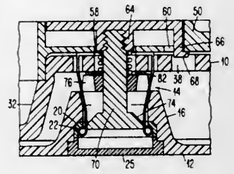
A disposable product such as a diaper characterized by having a generally trapezoidal configuration and made up of

outer sheets confining a generally rectangular fluff pad, the product sheets being united to confine the pad and per-



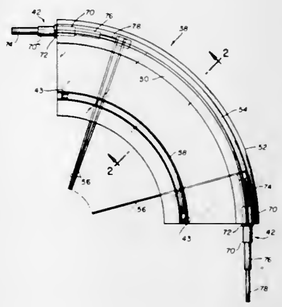
forated along generally straight lines to define detachable products.

3,578,156
CONTAINER FOR A REEL
Carl J. Norby, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.
Continuation of application Ser. No. 692,337, Dec. 21, 1967, now abandoned. Filed Sept. 29, 1969, Ser. No. 869,438
869,438
Int. Cl. B65d *85/67*
U.S. Cl. 206—52F **8 Claims**



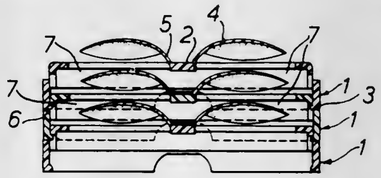
A container having a base member, a cover member and a locking mechanism for releasably locking the members together. A locking mechanism having a keeper, latching fingers for releasably engaging the keeper, and a pushbutton to release the fingers from the keeper.

3,578,157
DISPENSING CARTRIDGE
Laszlo Hidassy, Elizabeth, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Division of Ser. No. 705,046, Feb. 13, 1968, Pat. No. 3,515,-178. Filed Oct. 24, 1969, Ser. No. 869,303
Int. Cl. B65d *83/00*
U.S. Cl. 206—56AC **7 Claims**



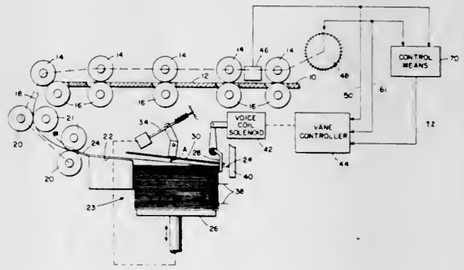
The cartridge of the invention is composed of two arcuate portions joined at their longer arcuate length and open at their shorter arcuate end to allow the articles stored therein to extend beyond the cartridge and to permit a feed mechanism to enter the cartridge and eject the articles therein. Expanded areas permit acceptance of the wider head portion of the articles and removable plugs placed therein provide for article alignment and packing as well as a simple way to permit removal of the articles in the cartridge.

3,578,158
ARTIFICIAL FINGERNAILS FOR WEAR
Eric Victor Aylott, Welwyn Garden City, England, assignor to Eylure Limited, Welwyn Garden City, England
Filed Mar. 3, 1970, Ser. No. 16,248
Claims priority, application Great Britain, Mar. 4, 1969, 11,395
Int. Cl. B65d *71/00*
U.S. Cl. 206—65K **6 Claims**



A unit of self adhesive fingernails connected to a stepped base member by a neck only the arrangement being such that several units may be stacked one on top the other without the nails coming into close contact with one another.

3,578,159
DOCUMENT-HANDLING APPARATUS
Everet F. Lindquist, and George E. Carsner, Iowa City, Iowa, assignors to Westinghouse Learning Corporation
Filed Feb. 18, 1969, Ser. No. 800,110
Int. Cl. B07c *5/00*
U.S. Cl. 209—74 **13 Claims**

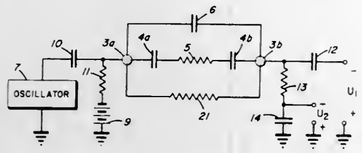


An arrangement for identifying particular documents, which are selected according to predetermined criteria, from other documents contained in a stack at the output end of an apparatus through which the documents were separately conveyed for processing or other purposes. The arrangement permits immediate identification in the output stack of the documents so selected without physically removing them from the stack and without disturbing the order of the documents as originally fed to the apparatus.

3,578,160
PROCESS AND APPARATUS FOR SEPARATING ARTICLES
Peter Albert Martini, Naupliastrasse 7, Munich, Germany
Filed Oct. 10, 1968, Ser. No. 780,924
Int. Cl. B07c *5/344*
U.S. Cl. 209—81 **10 Claims**

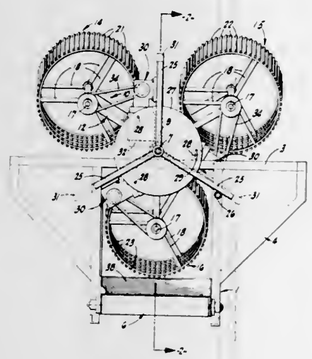
Process and device for separating potatoes from impurities such as clods and stones. The process consists of contacting

the items to be examined by a pair of spaced feelers which are connected with a measuring device for determining capacity and ohmic conductivity of the items being tested.



Various mechanical arrangements are provided for sequentially presenting test articles and for mechanically sorting or distributing the test articles responsive to the test results.

3,578,161
MACHINE FOR SIZE-GRADING WALNUTS
Hugh Perry Barton, Modesto, Calif., assignor to R. P. Barton & Company, Escalon, Calif.
Filed July 3, 1969, Ser. No. 838,761
Int. Cl. B07c *5/06*
U.S. Cl. 209—86 **9 Claims**

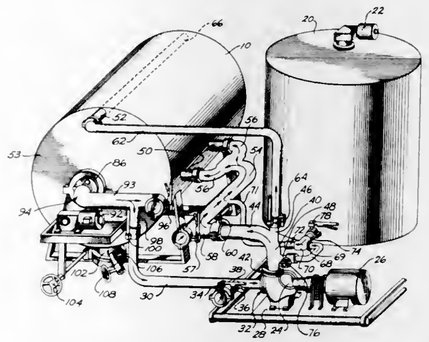


A machine, for size-grading walnuts (i.e. separating one size from another), comprising a plurality of rotary sizing reels or grate-bar-type trommels arranged on a supporting frame in a manner such that—selectively—any one of the trommels can be brought to a working position between a feed chute and carry-off conveyors mounted on such frame; the individual trommels, each relative to the others, having different spacing between the grate-bars whereby the machine can be set to size-grade walnuts which have different average sizes depending on the variety being processed.

3,578,162
BENEFICIATION OF MAGNESIAN ORES OR THE LIKE
Tage L. B. Jepsen, Gabbs, Nev., assignor to Basic Incorporated, Cleveland, Ohio
Continuation of application Ser. No. 725,526, Apr. 30, 1960, now abandoned. Filed Oct. 1, 1969, Ser. No. 862,979
Int. Cl. B03b *3/44*
U.S. Cl. 209—172 **8 Claims**

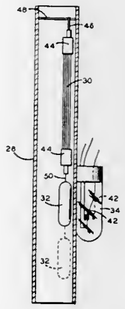
Beneficiation of magnesian ores and similar derivative mixtures for concentrating or upgrading the magnesium content, usually by removal of the undesired constituents. Such mixtures after size reduction to obtain desired liberation of constituents are subjected to float and sink separations in heavy media having a gravity intermediate the float and sink constituents. Mixtures include magnesite, brucite, hydromagnesite and dolomite ores and synthetic mixtures of $CaCO_3$ and hydrated magnesium carbonates with tetrabromoethane, methylene bromide, trichloroethylene, carbon tetrachloride and methylene iodide as heavy media diluted with lighter organic liquids as necessary to establish optimum specific gravity. Movement of material in separation zone causes lighter fraction to float to surface of media while heavier fraction penetrates media and is recovered as an underflow product.

3,578,163
METHOD AND APPARATUS FOR PRECOATING FILTER LEAVES
Theodore J. Warning, Walnut, Calif., assignor to U. S. Filter Corp., Whittier, Calif.
Filed Mar. 24, 1969, Ser. No. 809,757
Int. Cl. B01d *37/02*
U.S. Cl. 210—75 **19 Claims**



A layer of precoat material is applied to a rotary filter leaf prior to the filtration process. Filter cake accumulates on the leaf during filtering operations, and at the end of the filtration cycle the cake is removed by an adjustable knife blade so that the precoat layer remains on the leaf. The precoat material is then sluiced from the leaf, reslurried, and reapplied to the leaf to serve as the precoat layer for the next filtration cycle.

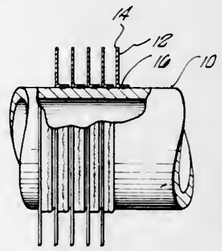
3,578,164
WATER SOFTENING CONTROL
Jonas Weiss, Plainfield, and William Hodes, Edison, N.J., assignors to American Standard Inc., New York, N.Y.
Filed May 14, 1968, Ser. No. 728,937
Int. Cl. B01d *15/04, 19/06*
U.S. Cl. 210—96 **4 Claims**



In a water-treating apparatus comprising in combination cation-exchange means for removing divalent cations from water to be treated and substituting for the divalent cations, cations selected from the group consisting of hydrogen ions and sodium ions, anion-exchange means for removing divalent anions from the water and substituting for the

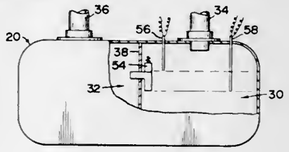
anions, anions selected from the group consisting of hydroxyl ions and chloride ions, sensing means consisting of a contractile fiber having a length dependent on the concentration of calcium ions in the water and located in the apparatus in the flow stream of the water at a point downstream of at least a portion of the cation-exchange means, the sensing means being sensitive to the concentration of calcium ions in the water, means for regenerating the cation-exchange means and the anion-exchange means, and means responsive to the sensing means for activating the regenerating means in response to a predetermined level of calcium ion concentration in the water, the improvement in the water-treating apparatus comprising as the sensing means a water insoluble contractile fiber composed of polymers containing nonhydrolyzable groups which groups are selected from the group consisting of carboxy, primary, secondary and tertiary amines and imine.

3,578,165
METHOD AND APPARATUS FOR MANUFACTURING RADIALLY FINNED HEAT EXCHANGE TUBING
Robert C. Boose, Pryor, Okla., assignor to Escoa Fintube Corporation, Pryor, Okla.
Filed Mar. 3, 1969, Ser. No. 803,598
Int. Cl. B23k *9/02*
U.S. Cl. 219—107 **14 Claims**



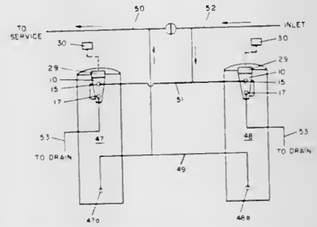
A method and apparatus are disclosed for manufacturing radially finned heat exchange tubing. In accordance with the method, one end of a solid metal L-shaped strip is initially secured to the outer periphery of the tube. The foot of the strip is directly urged against the tube at a plurality of points in advance of a welding station, as for example, by forming rollers. The welding station is energized to continuously weld the foot of the strip to the tube while the tube is rotated and advanced longitudinally. The apparatus disclosed includes a plurality of adjustable forming rollers mounted approximately in the plane of the welding station. Each of the forming rollers includes an annular slot for receiving and guiding the leg of the metal strip in a plane perpendicular to the axis of the tube. The edges of the rollers are disposed adjacent the outer periphery of the tube so that the foot of the strip is forced against the tube as it travels over the guide rollers.

3,578,166
SEPTIC TANK FOR WASTE DISPOSAL SYSTEM
Peter V. Paulus, Port Clinton, Ottawa, and Harry W. Green, North Olmsted, Ohio, assignors to The Standard Products Company, Cleveland, Ohio
Filed Mar. 17, 1969, Ser. No. 807,627
Int. Cl. C02c *1/26*
U.S. Cl. 210—110 **2 Claims**



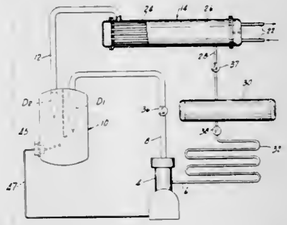
An improved septic tank having a pair of waste receiving chambers with one chamber being connected to the other by a drain pipe whereby liquid wastes from one chamber may drain over to the other after the bacteriological treatment has been completed.

3,578,167
MULTIPLE-TANK WATER CONDITIONING SYSTEM AND VALVE THEREFOR
Willis E. Clack; Clifford Kay, and Charles E. Nygren, Madison, Wis., assignors to Clack Corporation, Madison, Wis.
Filed Nov. 19, 1968, Ser No. 776,925
Int. Cl. B01d *29/08*
U.S. Cl. 210—134 **2 Claims**



A pair of water conditioning tanks each having a service port. The service ports are connected to each other and to a service outlet conduit. A pair of semibalanced, direct-acting control valves are provided, each having an inlet port, a tank port connected to one of the conditioning tanks, and a drain port. Each valve has a pressure responsive piston engaging the valve stem and a conduit for supplying line pressure to the piston to assist in operating the valve. Timed motor operators alternately maintain one of the valves in service position and the other in backwash position whereby each tank can be backwashed with conditioned water from the other.

3,578,168
REFRIGERATING APPARATUS HAVING OIL-SEPARATING MEANS
Whitney I. Grant, Muskego, Wis., assignor to Vilter Manufacturing Corporation, Milwaukee, Wis.
Filed June 25, 1969, Ser. No. 836,390
Int. Cl. B01d *50/00*
U.S. Cl. 210—167 **6 Claims**

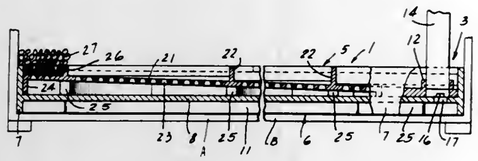


A refrigerating system having a compressor which delivers refrigerant to a condenser and an oil separator is interposed between the compressor and condenser. The oil separator includes a layer of asbestos and a screen mesh layer, the mesh layer functioning as a channel or path in which the oil can flow downwardly by gravity to thereby be separated from the vapor.

3,578,169
REVERSE-FLOW AQUARIUM FILTER DEVICE
Eugene B. White, Oak Park, Ill., assignor to Ken-Flo Products Corporation, Palos Heights, Ill.
Filed Mar. 7, 1969, Ser. No. 805,274
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **20 Claims**

An aquarium water purification system employing a tertiary filter cycle utilizing a shallow gravel-trickling filter with

underwater aeration and sedimentation followed by anaerobic action and final tertiary cycle, in a filter structure having

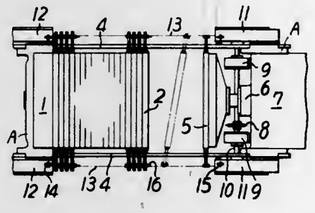


the filter material thereof disposed in a removable replaceable cartridge.

3,578,170
APPARATUS FOR DETECTING INCLINATION OF FILTER PLATES IN TRANSIT

Ken-Ichiro Kurita, 36-4, 5-chome, Senriyama-nishi, Suita, Osaka Prefecture, Japan

Filed Jan. 12, 1970, Ser. No. 002,267
Int. Cl. B01d *25/00*
U.S. Cl. 210—230 **4 Claims**

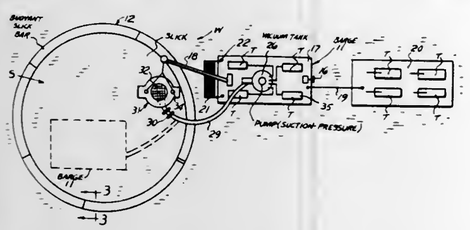


A prevention apparatus is for use in a filter press provided with a group of filtering elements supported between a stationary end plate and a movable end plate and adapted to be released horizontally for the removal of cake or to be compressed together for filtration. Disposed at least along one side of the group of filtering elements is a detecting line employing a light beam, lead wire or wire rope which has linearity in parallel with the direction of movement of the filtering elements. A blocking member is mounted on each of the filtering elements in corresponding relationship with the detecting line. When the filtering element is inclined due to some trouble during transit, the detecting line is interfered with by the blocking member to halt the transport of the filtering elements or give a warning.

3,578,171
APPARATUS FOR REMOVING FLOATING POLLUTANTS

David Usher, 9010 Roselawn Ave., Huntington Woods, Detroit, Mich. 48204

Filed Apr. 2, 1969, Ser. No. 812,780
Int. Cl. B01d *21/00*
U.S. Cl. 210—242 **3 Claims**

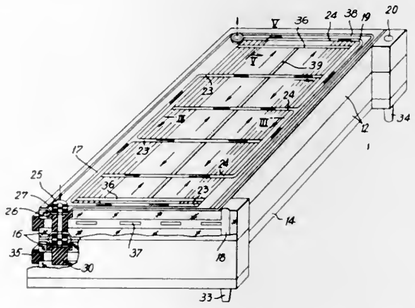


Apparatus for removing oil and other floating pollutants from a body of water employing a barge which consists of means for encompassing a slick and confining it to prevent lateral spreading, skimming and withdrawing the pollutant under vacuum to a storage area on a barge, pumping into settling tanks and simultaneously siphoning off the water; and transporting a barge and its pollutant removal equipment by one from the group consisting of air, truck and rail, to any remote point for emergency use.

3,578,172
APPARATUS FOR REMOVING TOXIC SUBSTANCES AND EXCESS WATER FROM THE BLOOD

Maria Gavrilovna Sirotkina, Prospekt Mira, 180, Kv. 193, Moscow; Jury Gotlibovich Kozlov, Khoroshevskoe shosse, 11, kv. 47; Alevtina Vasilievna Alexeeva, Botanichesky proezd, 3a, kv.16; Ljudmila Alexeevna Afanasieva, Anadyrsky proezd, 1, kv.78; Galina Nikolaevna Benyash, Khutorskaya ulitsa, 7, kv.28; Efim Bentsionovich Gorbovitsky, 4 Vishnyakovsky proezd, 5, korpu, 4, kv.27; Ljudmila Alexeevna Levitskaya, Kotelnichedkaya naberezhnaya, 25 kv.5; Galina Konstantinovna Lisitsina, Ulitsa Moldtsova, 9, kv.7; Anatoly Stepanovich Tkachenko, ulitsa Iva Tolstogo, 5, kv.7, Pushkino, Moskovskaya obl., and Adolf Iserovich Khaitlin, Bolshevistsky pereulok, 13/3, kv.13, U.S.S.R.

Filed June 7, 1968, Ser. No. 735,322
Claims priority, application U.S.S.R., Sept. 25, 1967, 1,186,150
Int. Cl. B01d *31/00*
U.S. Cl. 210—321 **4 Claims**

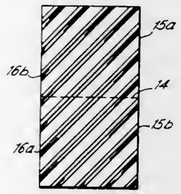


An apparatus for removing toxic substances and excess water from blood being intended for treating chronic cases of renal insufficiency. In contrast to the devices known in the art, the present apparatus provides an effective normalization of aqueous-electrolytic balance and elimination of toxic products of metabolism when it is not necessary to introduce the donor blood for the initial filling of the blood conveying system. In said apparatus, the resistance of the blood conveying system of the dialyzer is reduced. The elements of the blood conveying system are sterilized by oil boiling or treating in an autoclave.

3,578,173
FOLDED SEMIPERMEABLE MEMBRANE

Robert John William Streeton, Harwell, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 21, 1968, Ser. No. 777,784
Claims priority, application Great Britain, Nov. 24, 1967, 53565/67
Int. Cl. B32b *3/04*; **B01d** *39/16*
U.S. Cl. 210—321 **4 Claims**



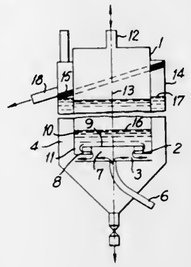
A semipermeable membrane is made by casting on a ridged casting plate so that the rear surface of the membrane

is grooved and it can be supported by a rigid impervious backing plate. Alternatively the membrane may be folded (at an angle to the grooves) so as to be self-supporting.

3,578,174
FLUID-FLOW PUMP

Susanna Mikhailovna Karpacheva, 2 Schulinsky proezd, 2, kv. 88; Leonid Solomonovich Raginsky, Nikitinskay ulitsa, 16 korpusl kv. 29; Valerian Matveevich Muratov, Astakhovsky pereulok, 1/2, kv. 1; Vladimir Dmitrievich Ivanov, 2, Schukinsky proezd 11, kv. 6, Moscow, and Jury Nikolaevich Baulin, ulitsa Parkovaya, 5, kv. 120, Balashikha Moskovskoi oblasti, U.S.S.R.

Filed July 19, 1968, Ser. No. 746,092
Int. Cl. B01d *35/26*
U.S. Cl. 210—416 **3 Claims**

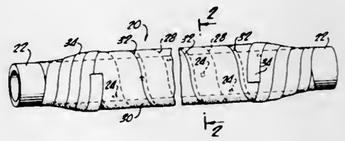


A pump comprises a pulsation chamber from which liquid is ejected through a nozzle apparatus into a discharge chamber and a discharge pipe. A fluid inlet pipe opens into the discharge chamber beneath the nozzle apparatus and coaxially therewith to supply liquid under suction pressure. The nozzles of the nozzle apparatus are placed tangentially so that the liquid from the pulsation chamber moves with rotary motion from a center to the periphery. The pump is used in a filter apparatus by placing the pump in a body containing a filter element, the body forming the discharge chamber and the discharge pipe.

3,578,175
HELICALLY WOUND SEMIPERMEABLE MEMBRANE

Serop Manjikian, Del Mar, Calif., assignor to Universal Water Corporation, Del Mar, Calif.

Filed Apr. 23, 1969, Ser. No. 818,514
Int. Cl. B01d *31/00*
U.S. Cl. 210—489 **11 Claims**

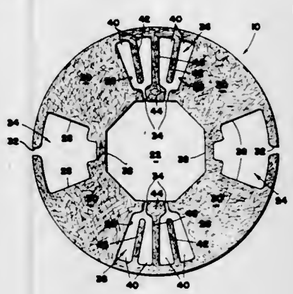


A membrane element, useful in treatment of a solution by osmosis or reverse osmosis, comprises a porous support structure around which is a semipermeable membrane preferably formed by helically winding a strip of semipermeable membrane material. The edges of adjacent turns of membrane strip are preferably overlapped and the overlapped portions are bonded together as by use of adhesive, or solvent bonding. An intermediate layer of porous backing material may be employed between the support structure and the membrane, and this can be formed by helically winding a strip, for example, of nylon cloth, preferably with contiguous edges abutted. The support structure may be of circular cross section outline, or may be of polygonal outline. A helically wound backing layer may be employed with a membrane cast on its surface.

3,578,176
FILTER DISC

Kenneth W. Cuyler, Deerfield, Ill., assignor to William W. Nugent & Company, Inc., Skokie, Ill.

Filed May 8, 1969, Ser. No. 823,098
Int. Cl. B01d *29/34*
U.S. Cl. 210—492 **4 Claims**

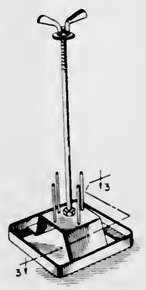


For use in a stack of axially aligned and axially compressed discs of filtering material having circumferentially spaced and alternating inlet and outlet openings communicating through inlet and outlet passageways respectively with the outer peripheries and central apertures of the discs, a disc in which the inlet and outlet openings are shaped and sized to avoid collapse of adjacent discs into the outlet openings and the outlet passageways and to provide a large sealing pressure at the overlapping surfaces of adjacent discs to prevent liquid being filtered from passing between the discs of filter material.

3,578,177
STORAGE RACK FOR LEVELING JACKS

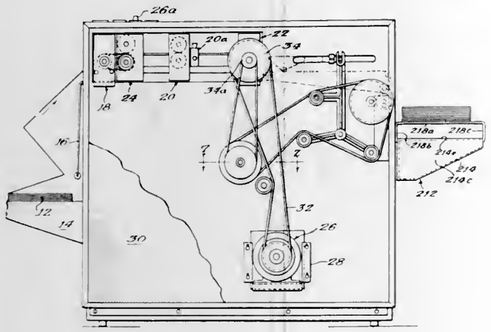
Ray Wellington Paden, R. D. #1, Nescopeck, Pa.

Filed Feb. 19, 1970, Ser. No. 12,674
Int. Cl. A47f *7/00*
U.S. Cl. 211—49 **10 Claims**



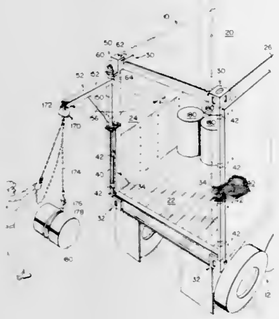
A special rack for storing a set of leveling jacks of the type including a hollow tapered stand with side openings and a top aperture removably receiving an adjusting screw. The rack consists of a base with a vertical shaft, a set of jack stands being nested on the base so that the shaft passes through the top apertures thereof and a retaining nut on the shaft serves to hold the nested stands against the base. Supporting elements for the jack adjusting screws are provided on the base around the shaft and support the screws which extend upwardly and outwardly through the side openings of the nested stands.

3,578,178
ADJUSTABLE OUTFEED ASSEMBLY FOR STATIONERY BURSTER
Howard K. Absler, Skokie, and Leonard M. Narel, Cary, Ill., assignors to Uarco Incorporated
Division of Ser. No. 645,262, June 12, 1967, Pat. No. 3,493,-156. Filed May 2, 1969, Ser. No. 862,538
Int. Cl. A47f *7/00*
U.S. Cl. 211—50 **3 Claims**



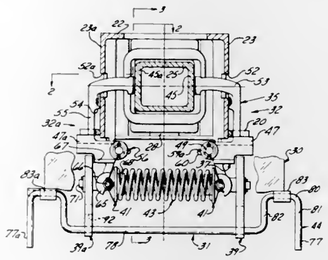
A stacking tray for use with a stationery burster, the stacking tray having a fixed medial portion flanked by portions movable with respect to the remainder thereof to accommodate uneven marginal areas of stationery dispensed thereon.

3,578,179
PORTABLE JIB CRANE
Richard T. Fujioka, Oxford, Mich., assignor to Fruehauf Corporation, Detroit, Mich.
Filed Jan. 16, 1969, Ser. No. 791,589
Int. Cl. B66c *23/02*
U.S. Cl. 212—61 **10 Claims**



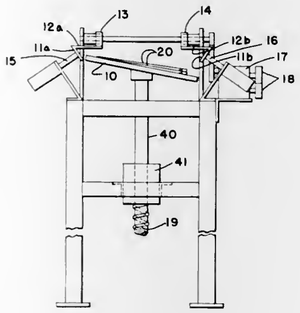
A support portion includes depending pins at the upper end thereof for fitting within a hole in a corner casting of an associated structure such as a container or the like. A locking bar and a spaced retainer member are carried at the lower part of the support portion and engage a corner post portion of the associated structure for holding the support portion in place. A load-carrying portion is swingably carried by said support portion, the load-carrying portion including a horizontally extending member having means at the outer end for carrying a load.

3,578,180
CAR COUPLER CENTERING DEVICE
William J. Metzger, Cleveland, and Kenneth L. DePenti, Mayfield Heights, Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio
Filed Dec. 19, 1968, Ser. No. 785,225
Int. Cl. B61g *7/12*
U.S. Cl. 213—20 **18 Claims**



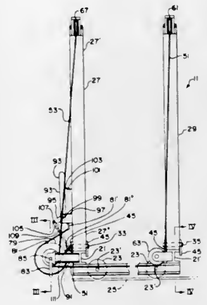
A railway car coupler centering device for maintaining an uncoupled car coupler centered in relation to the associated vehicle body center sill structure. The device automatically returns the shank of the coupler to a central position within the coupler housing after the coupler has been shifted laterally in either direction. The device includes a release mechanism which, when actuated, inactivates the centering units of the device when coupler alignment requires an uncoupled coupler to be manually moved to an offcenter position for car coupling operations, as on a curved section of track. The device also includes mechanism for automatically reengaging the centering units, after they have been inactivated, once the shank of a laterally displaced coupler is returned to its central position.

3,578,181
PARTS STACKER
Francis H. Hughes, and Douglas J. Crawford, Troy, N.Y., assignors to Cluett Peabody & Co., Inc., Troy, N.Y.
Filed Mar. 24, 1969, Ser. No. 809,628
Int. Cl. B65g *57/06*
U.S. Cl. 214—6 **2 Claims**



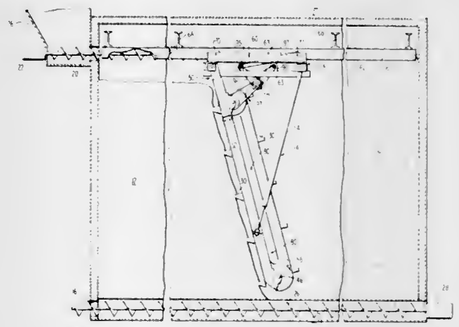
A parts stacker particularly useful for handling limp fabrics, especially garments parts such as shirt sleeves, and including relatively narrow supports having low friction surfaces. The supports are retractable and cooperate with belts which engage the surfaces and feed the parts onto them.

3,578,182
LUMBER CART HAVING CRADLE WITH VARIABLE HEIGHT
Edward M. Harvey, 200 Meadowbrook, Hot Springs, Ark.
Filed Oct. 2, 1969, Ser. No. 863,061
Int. Cl. B65g *57/03*
U.S. Cl. 214—6 **4 Claims**



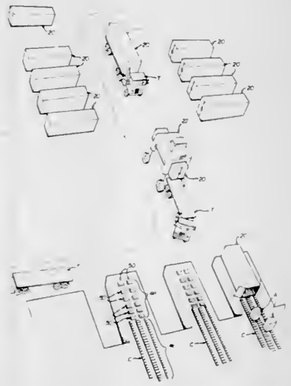
A lumber cart for use in the lumber industry such as a sawmill for receiving lumber pieces one at a time from a conveyor such as a lumber sorter, which categorizes lumber into categories having identical dimensions. The cart includes a rectangular frame supported on four wheels adapted to ride on rails, four stanchions positioned one at each corner and a winchlike mechanism having two spools for winding wire rope cable onto and a brake band and drum portion which creates holding action of the spools stopping rotation of the spool assembly when the brake band is allowed to engage the brake drum. The wire rope cable is arranged between the two forward stanchions and the two rearward stanchions in such a manner that the slack in the suspended cable forms a cradle for receiving the lumber pieces at an elevation near the uppermost portion of the stanchions and the winchlike mechanism enables the cradling portion of the cables to slippingly change elevation downwardly to variable heights. Two of the stanchions, one fore and one aft both being on the same side of the cart, are pivotally attached to the frame allowing them to articulate outwardly facilitating unloading.

3,578,183
METHOD AND APPARATUS FOR CONVEYING MATERIAL
Nelson N. Larger, Salisbury, Md., assignor to A. W. Perdue & Son, Inc., Salisbury, Md.
Filed Mar. 3, 1969, Ser. No. 803,584
Int. Cl. B65g *65/42*
U.S. Cl. 214—17 **17 Claims**



Unloading material such as ice from a storage room by gradually moving a vertical conveyor horizontally against a supply of ice to raise portions of the ice and deposit the same at the top of the conveyor into a chute mounted on the conveyor to convey the ice downwardly onto a horizontal conveyor which leads out of the storage room. A plurality of bucket members are secured to vertically movable endless drive members in the vertical conveyor for picking up, raising and then discharging portions of the ice into the chute, the bucket members also having a plurality of prongs for scarifying the ice. The vertical conveyor is moved against the ice by means of an overhead trolley from which the conveyor is suspended, the overhead trolley being movable along a horizontal track under the power of a motor which also is employed to drive the endless members. In one embodiment, an agitating mechanism is mounted on the top of the vertical conveyor to be movable therewith by means of the trolley.

3,578,184
ARTICLE HANDLING METHOD AND APPARATUS
Wilbur A. Schaich, Maumee, Ohio, assignor to Owens-Illinois, Inc.
Filed Mar. 20, 1969, Ser. No. 808,887
Int. Cl. B65g *67/02*
U.S. Cl. 214—38 **8 Claims**

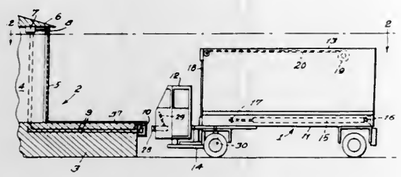


Methods and apparatus for transporting and handling relatively large articles of uniform size, as for example, loaded pallets. A boxlike unit load container, of a size corresponding generally to that of the cargo portion of a conventional semitrailer, is constructed with an open framed gridlike bottom having openings of lesser dimensions than those of the bottoms of the individual articles or pallets so as to support the articles with a major portion of the bottom surface of the article overlying and exposed through one or more of the openings in the container bottom. A shipping or receiving dock platform is provided with a conveyor system with a terminal group of conveying elements arranged in a pattern corresponding to that of the openings in the unit load container bottom so that the conveying elements can project or be projected upwardly through the openings in the container bottom to an elevation above the article supporting surface of the bottom when the container is at rest on the dock platform. The conveying elements thus enable the articles or loaded pallets to be conveyed into or out of the unit load container. The container is provided with means for detachably securing it onto the bed of a trailer frame for over-the-road transport and the securing means can also be employed to secure the container to a lifting sling.

3,578,185
MECHANIZED VEHICLE SYSTEM
David F. Black, Salt Lake City, Utah
Filed Sept. 9, 1969, Ser. No. 856,409
Int. Cl. B60p *1/52*
U.S. Cl. 214—38 **7 Claims**

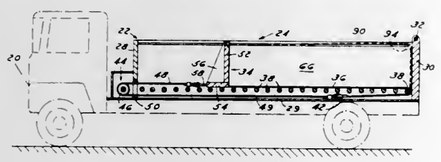
A mechanized system for the automatic loading and unloading of a vehicle of the front loading type. The vehicle is provided with a cab which will swing 90° to the left thereof

and a bed which is movable longitudinally on the vehicle's chassis. Powered rollers on the floor of the bed move the cargo into or out of the vehicle. A switch in front of the vehicle's cab will activate means to open the door of a warehouse when the cab is in close proximity to the



warehouse dock. The cab is swung to the left of the vehicle and the bed moved onto the dock to the warehouse door. All operations are controlled by the driver and he is protected from inclement weather at all times. The system eliminates the need for fork lifts in loading or unloading.

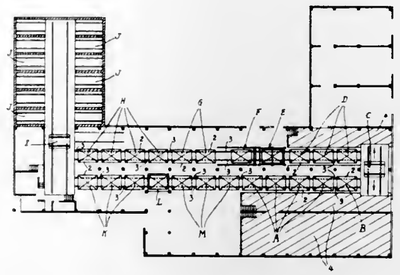
3,578,186
VEHICLE UNLOADER
Henry D. Thomas, 16180 Markese Ave., Allen Park, Mich.
Filed Apr. 10, 1969, Ser. No. 815,136
Int. Cl. B60p *1/36*
U.S. Cl. 214—83.22 **14 Claims**



A pusher and a floor belt in a dump box of a vehicle for unloading or dumping material from the dump box. The pusher and the belt are moved longitudinally through the dump box by a winch and interconnecting cables. Batch boards and a tailgate are also carried by tracks connected to the dump box to provide separate compartments for carrying individual batches of material. In one modification the tracks are arranged so that the tailgate and sequentially each batch board can be moved to the rear of the dump box beyond the floor belt so that the material on the belt will be discharged from the dump box as the pusher is moved toward the rear of the box.

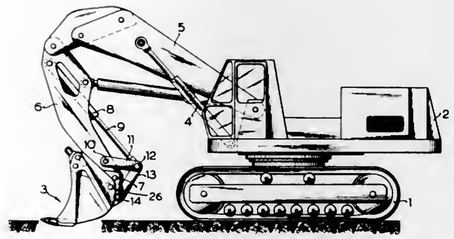
3,578,187
INSTALLATION FOR THE PREFABRICATION OF CONSTRUCTION ELEMENTS
Jean Charles Stribick, 7, Cours, Hippolyte Saiezea, Saint-Etienne, Loire, France
Filed Mar. 19, 1968, Ser. No. 808,451
Claims priority, application France, Mar. 21, 1968, 68143
Int. Cl. B23g *5/22*
U.S. Cl. 214—89 **4 Claims**

An installation for the prefabrication of construction elements is provided with translating elements such as rails forming in a base plane various conveyor lines for pallets carrying elements and molds for the elements. At operating stations along the conveyor lines is a lifting device for raising the pallets to upper operating stations and lowering them. The lifting device has a shoe for each corner of a pallet. The shoe is fixed to a nut screwed on a vertical screw which is rotated by a horizontal shaft and bevel gears, driven by a central motor. Operations of long duration can thereby be performed at upper stations while pallets not requiring such operations can continue to circulate along the conveyor



lines. The installation can be automated through a central control desk.

3,578,188
BUCKET ACTUATED MEANS FOR EXCAVATOR
Gotthardt Drieschner, Dortmund-Wellinghofen, Germany, assignor to Orenstein-Koppel Aktiengesellschaft, Dortmund-Dorstfeld, Germany
Filed Oct. 22, 1968, Ser. No. 769,653
Claims priority, application Germany, Oct. 26, 1967, P 16 34 921.6
Int. Cl. E02f *3/74*
U.S. Cl. 214—138 **9 Claims**

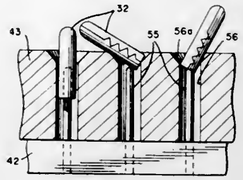


A power transfer mechanism for excavator bucket operation by fluid actuator means effective upon a working point, to which a rocker arm is journaled from a dipper arm pivot located above the turning axis of the bucket and to which a coupling member is journaled from a bucket pivot located below the turning axis of the bucket. A bucket front portion is tiltable during bucket opening and closing with respect to a turning point shaft in radial alignment with semicircular formed guide slot means of a box-formed housing of the bucket back portion. A housing cover provides access to parts including fluid actuator means protected in the box-formed housing and used to effect tiltable movement of the front portion with respect to the back portion of the bucket.

3,578,189
METHOD FOR ORIENTING AND ASSEMBLING SMALL PARTS
John L. Yonkers, 2030 Sunset Ridge Road, Northbrook, Ill.
Division of Ser. No. 498,710, Oct. 20, 1965, Pat. No. 3,468,-024. Filed Dec. 26, 1968, Ser. No. 839,738
Int. Cl. B65g *1/00*
U.S. Cl. 214—152 **3 Claims**

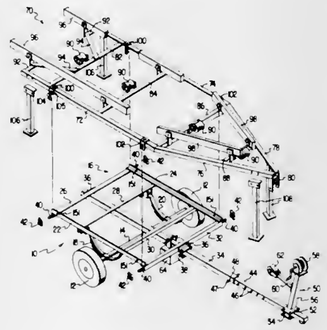
This invention relates to a method of orienting and gauging the internal and external diameters of small hollow parts. To carry out this method, a gauge plate having a plurality of upstanding gauge pins is provided. An orienting plate having a plurality of openings is placed over the gauge plate with the pins extending through a respective one of said openings. A random supply of said parts is placed over the said orienting plate which is then vibrated to simultaneously fill a majority

of said openings with the hollow parts fitted over the gauge pins. The orienting plate is then removed and a transfer plate having a plurality of transfer cavities is assembled against the gauge plate with the parts supported on the gauge pins being



received in said transfer cavities. The assembly of said transfer plate and said gauge plate is inverted so that the parts move into the transfer cavities and the assembly is then separated.

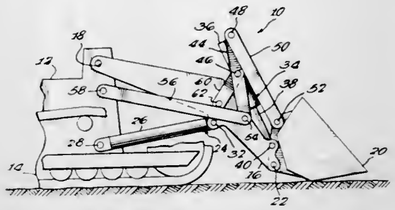
3,578,190
MULTIPURPOSE TRAILER
Joe C. May, 139 Calhoun St., Biloxi, Miss., and James D. Lowery, Jr., 127 T Pass Road, Jackson, Miss.
Filed July 7, 1969, Ser. No. 839,485
Int. Cl. B60p *3/10*
U.S. Cl. 214—505 **13 Claims**



A multipurpose trailer particularly adapted for use as a combination boat and dog/utility trailer in which a separable frame is provided for supporting a boat on a running gear for the transporting thereof, as well as independently of the running gear for the storage thereof. A method for mounting and dismounting the separable frame from the running gear with a boat thereon is also disclosed.

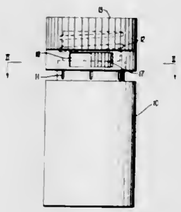
3,578,191
LOADER LINKAGE
Rodolf Horsch, Burlington, Iowa, assignor to J. I. Case Company
Filed Oct. 13, 1969, Ser. No. 865,819
Int. Cl. B66f *9/00*
U.S. Cl. 214—771 **9 Claims**

In a material handling device of the type in which lift arms are pivotably mounted on a support and pivotally carry a bucket controlled by a hydraulic circuit including a bucket cylinder arranged to provide maximum hydraulic force for break out or rollback of the bucket and maximum speed for the dumping or forward roll of the bucket, an automatic self-leveling and antirollback linkage connected between the bucket and the support including a first member pivotally connecting the cylinder to the lift arms and a second portion including three members pivotally connected end to end and having one end pivotally connected to the bucket, the other end pivotally connected to the support and the middle member pivotally connected to the cylinder. The linkage connects the bucket to the bucket cylinder to effect pivoting of the bucket upon operation of the bucket cylinder, levels the bucket relative to the ground and prevents rollback of



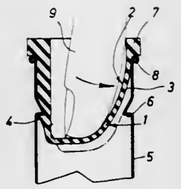
the bucket past its level position when the lift arms are raised.

3,578,192
TAMPERPROOF CAP FOR RECEPTACLE
Hans Sonne, 4534 Horve, Denmark
Filed June 25, 1969, Ser. No. 836,321
Claims priority, application Denmark, Jan. 31, 1969, 545/69
Int. Cl. A61j *1/00;* **B65d** *55/02*
U.S. Cl. 215—9 **5 Claims**



The invention relates to tamperproof receptacles provided with a rotatable cap, the latter having an annular recess for reception of a flexible band that includes a latch and a manual control therefor, said latch cooperating with dimples on the neck of the receptacle to permit either free relative movement of the cap on the receptacle for complete removal or prevent movement thereof depending upon the position of the manual control.

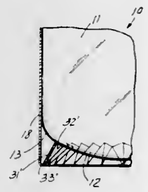
3,578,193
SAFETY STOPPER
Maurice Steiner, 40bis avenue de Suffren, 75 Paris 15, France
Filed June 17, 1969, Ser. No. 834,039
Claims priority, application France, June 19, 1968, 155,633
Int. Cl. A61j *1/00;* **B65d** *55/02, 39/00*
U.S. Cl. 215—9 **4 Claims**



Safety stopper having a recess of the general shape of a glove finger so that the user may insert his finger therein and an outer wall adapted to be introduced into the top portion of the container to be closed and provided with at least one element adapted to cooperate with a corresponding element provided on the inner wall of said top portion of said container in order to lock the stopper within said portion, said

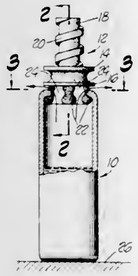
locking elements being so arranged as to ensure that the stopper is released as a result of action exerted within the recessed portion of said stopper.

3,578,194
THROW-AWAY BEVERAGE BOTTLES
Richard T. Cornelius, Minneapolis, Minn., assignor to The Cornelius Company, Anoka, Minn.
Filed Sept. 20, 1968, Ser. No. 761,086
Int. Cl. B65d *11/04, 11/22*
U.S. Cl. 215—13 **7 Claims**



Low cost, large capacity, lightweight plastic bottles, especially suitable for carbonated beverages, have burst-resistant construction in which an upright wall and a concave-convex bottom wall may have the thinnest practicable wall section; and a combination label and a bottle-supporting skirt is affixed to the lower end portion of the bottle.

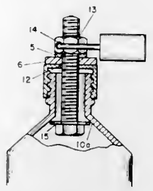
3,578,195
LYOFLO-STOPPER
Robert W. Ogle, Newport Beach, Calif., assignor to Lyoflo-Stopper Corporation, Wilmington, Del.
Filed Jan. 16, 1969, Ser. No. 791,727
Int. Cl. B65d *39/04, 51/16*
U.S. Cl. 215—47 **1 Claim**



This patent describes a novel resilient lyophilizing stopper for use in a vial or other medicament container having an open end, said stopper comprising an upper portion having one or more sealing rings adapted to form a seal on the inside walls of said vial and act as a piston therein, and a lower portion comprising a series of interruptions around the periphery of the lower portion, said interruptions forming a force compression fit with the walls of the vial and the spaces between the interruptions being adapted to provide a gas passage from the interior of the vial to the exterior when said sealing rings are held beyond the end of the vial by said interruptions.

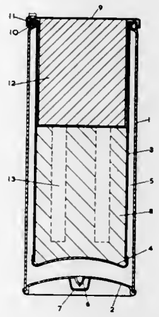
3,578,196
BOTTLE-LOCK
Lee Ender, 1509 Madison St., Madison, Dane County, Wis.
Filed Jan. 21, 1969, Ser. No. 800,797
Int. Cl. B65d *45/02*
U.S. Cl. 215—88 **1 Claim**

A bottle has a threaded neck and a cap threaded on the neck. Locking means extends between a shoulder on the in-



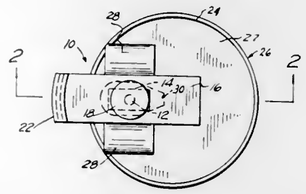
terior of the bottle and the cap to prevent unauthorized removal of the cap.

3,578,197
POROUS MASS AND A CONTAINER THEREFOR
Leslie G. Taylor, Wimbledon, and Donald S. Withey, Beddington, England, assignors to The British Oxygen Company Limited
Division of Ser. No. 641,914, May 9, 1967, abandoned. Filed Feb. 20, 1969, Ser. No. 817,206
Int. Cl. B65d *25/00*
U.S. Cl. 220—16 **2 Claims**



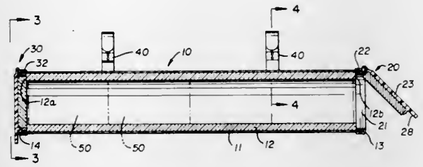
A porous mass having a high absorptive capacity for a liquefied gas is housed in a vented thermally insulated container, the porous mass having recesses therein for the reception of materials requiring refrigeration by said liquefied gas has been inserted.

3,578,198
STOPPER FOR SELF-OPENING CAN
Dan Blechman, 1200 N. State St., Los Angeles, Calif.
Filed Aug. 30, 1968, Ser. No. 756,524
Int. Cl. B65d *45/00*
U.S. Cl. 220—25 **4 Claims**



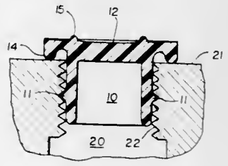
A stopper for a metal beverage can provided with an easy opening or ring-pull top. The stopper includes an inner clamp member adapted at one rotated position to be insertable through the opening in the can and upon being rotated and being brought up tight against the underside of the top of the can to bring an upper seal member into sealing engagement with the top of the can to seal the opening.

3,578,199
PORTABLE CARRIER FOR BEVERAGE CONTAINERS
Allen B. Duncan, 327 W. Wooster St., Bowling Green, Ohio
Filed Apr. 9, 1969, Ser. No. 814,624
Int. Cl. B65d *25/14, 43/16*
U.S. Cl. 220—31 **5 Claims**



A lightweight portable insulated carrier adapted to carry drink containers, such as cans, consisting of an elongate hollow tubular insulated body with closure members attached to each end thereof, the closure members being hinged and adapted to be moved between open and closed positions for access to the interior of the body and releasable means are carried by the body for mounting the carrier on a suitable supporting member such as the handle of a golf cart for example, the closure members being insulated and locking means being provided so that the interior of the container can be securely closed off and insulated.

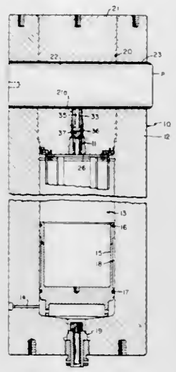
3,578,200
PORT PROTECTORS
Harry Hetzer, Depew, N.Y., assignor to GTI Corporation, Meadville, Pa.
Filed Nov. 3, 1969, Ser. No. 873,584
Int. Cl. B65d *39/04;* **F16i** *57/00;* **B65d** *59/02*
U.S. Cl. 220—42B **5 Claims**



A port closure is provided for threaded ports comprising a resilient cylindrical member adapted to slidably fit within said port and having an interrupted thread on the exterior thereof intermediate the ends engaging the threads in said port, a circular end cap covering one end of said cylindrical member and extending beyond the periphery forming an annular radial flange, a depending ring at the outer periphery of the flange spaced from the cylinder and engaging the surface surrounding the port and spacing the flange therefrom when the cylinder is in place in said port whereby the cylinder is under axial tension between the thread and end cap.

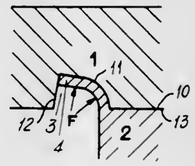
3,578,201
VENT VALVE ASSEMBLY
Charles W. Smith, Jr., Erie, Pa., assignor to Autoclave Engineers, Inc., Erie, Pa.
Filed Sept. 30, 1969, Ser. No. 862,262
Int. Cl. B65d *51/16*
U.S. Cl. 220—44 **7 Claims**

A vent and drain valve useful for venting a pressure chamber and draining displaced fluid from within the chamber, as in an isostatic press, including a housing supporting independently biased, vertically slideably upper and lower plungers having cooperating working faces. The valve, which is positioned in a base in the cover for the chamber, provides an opening through the cover to permit flow of fluid upwardly through the valve from within the chamber. As pressure is increased in the chamber, the lower plunger is



moved upwardly to cause the plunger faces to seal against one another to prevent leakage through the valve.

3,578,202
SEALING ASSEMBLY AND METHOD
Maurice Mainet, Asnieres, France, assignor to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France
Filed Nov. 4, 1969, Ser. No. 873,986
Claims priority, application France, Nov. 8, 1968, 173,070
Int. Cl. B65d *53/00*
U.S. Cl. 220—46 **30 Claims**

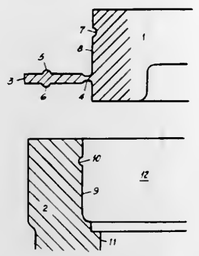


Sealing elements and method for their assembly wherein the assembly comprises a first element having a body with at least one projection fixed thereto, wherein the projection is formed of a material which is deformable and which has an elastic memory, and a second element having at least one groove therein which is adapted to receive the projection of the first element whereby said projection is urged toward a sealing relation with the groove in response to the combination of forces generated by the elastic memory of the projection and by the internal pressures exerted on the sealing elements.

3,578,203
SEALING ASSEMBLY
Maurice Mainet, Asnieres, France, assignor to Produits Chimiques Pechiney Saint-Gobain, Neuilly-sur-Seine, France
Filed Nov. 4, 1969, Ser. No. 873,914
Claims priority, application France, Nov. 8, 1968, No. 173,071
Int. Cl. B65d *53/00*
U.S. Cl. 220—46 **18 Claims**

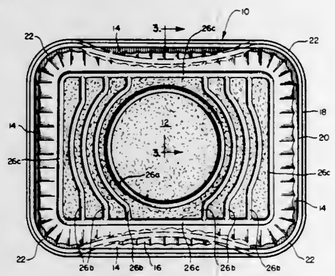
A sealing assembly for forming a tight sealing relationship between at least two elements which comprises a spline member having two lateral faces having at least one convex relief element on each face, a first element and a second element, each of which have at least one wall with a recess formed therein which is adapted to receive the relief element on each lateral face of the spline member, and wherein one of the elements defines a cavity adapted to receive the other

element and the spline member whereby the spline member may be interposed between the walls of the elements to form a tight seal there between when the relief elements of the



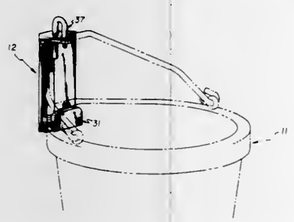
spline member are engaged with the recess in each of the walls to thereby prevent movement of one of the elements to the other.

3,578,204
CONTAINER WITH FLEXIBLE REINFORCED WALL MEMBERS
Roy W. Bloch, Northbrook, and Donald K. Jewell, Chicago, Ill., assignors to Ekco Products, Inc., Wheeling, Ill.
Filed May 28, 1969, Ser. No. 828,542
Int. Cl. B65d *7/42*
U.S. Cl. 220—72 **6 Claims**



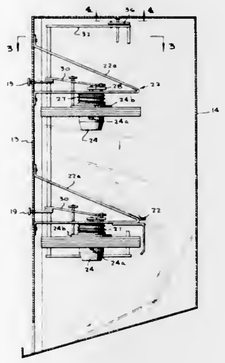
A relatively flexible container comprising a bottom wall and sidewalls extending upwardly therefrom. The bottom wall contains rib means which provide for the downward bulging of the bottom wall when opposing sidewalls of the container are pressed inwardly.

3,578,205
CORNER SUSPENDABLE PAIL AND HANGER
Jose F. Ballester, 5 Suchville R.F.D. 52, Bayamon, P.R.
Filed Oct. 21, 1968, Ser. No. 769,263
Int. Cl. B65d *25/00*
U.S. Cl. 220—85 **13 Claims**



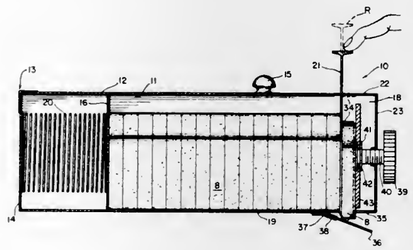
A corner suspendable pail and hanger wherein the pail is supported by a downturned lip on its top edge engaged with an upstanding flange on the bottom of the hanger as well as by a handle, pivotally mounted to the top edge of the pail, detachably secured to the top of the hanger by means of a slidable lockpin.

3,578,206
PHONOGRAPH RECORD VENDING MACHINE
Jack C. Moore, 1238 Brown St., Alton, Ill.
Filed May 14, 1968, Ser. No. 729,132
Int. Cl. B65g *59/00*
U.S. Cl. 221—124 **4 Claims**



A vending dispenser for phonograph records wherein a plurality of spindles are supported in alignment along a common vertical axis for releasably storing a plurality of records each, the spindles being supported adjacent their uppermost ends by V-shaped brackets having a horizontal portion attached to a vertical wall and supporting the spindle, and an inclined portion also attached to the vertical wall and joining the horizontal portion at an apex spaced from another vertical wall paralleling the first vertical wall, whereby records released from any of the spindles are guided into the space between the apex and the other vertical wall by the inclined bracket portion and are then gravitationally discharged to the lower part of a record case for discharge externally therefrom.

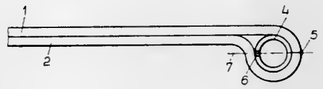
3,578,207
ADJUSTABLE BREAD DSIPENSER WITH EJECTOR-CONTROLLED CLOSURE
James F. Danow, 2163 Vine St., Apt. A, Berkeley, Calif.
Filed Oct. 21, 1968, Ser. No. 769,316
Int. Cl. B65h *1/08*
U.S. Cl. 221—232 **11 Claims**



A bread dispenser comprises a container adapted to retain a stack of sliced bread therein. Spring means are disposed at one end of the container to urge the bread towards a dispensing means mounted at the other end thereof. The dispensing means comprises a guillotinelike plunger recipro-

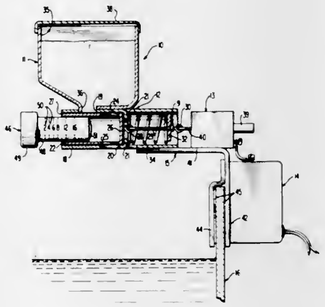
cally mounted on the container to dispense one or more bread slices.

3,578,208
WATCH BAND STRAP WITH RELEASABLE END CONNECTION
Hilmar Herzog, Nottingen, Germany, assignor to Firma Gustav Bauer, Otto-Maurer Str., Germany
Filed Feb. 18, 1969, Ser. No. 800,217
Int. Cl. A44c *5/00*
U.S. Cl. 224—4 **12 Claims**



A tubular element of elastic temporarily deformable, preferably thermoplastic material is bonded to the watch strap, for example by fusion if the watch strap is likewise of plastic material; the tubular element has a transverse slit so that, upon deformation of the tubular element in the region of the slit, the cross pin of a wrist watch case can be snapped through the slit into the hollow of the tube.

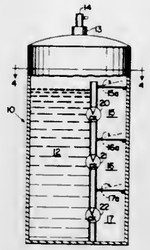
3,578,209
TIMED FEEDING MECHANISM
James K. Fraser, 1356 Clairmont Road, Decatur, Ga.
Filed Dec. 10, 1968, Ser. No. 782,539
Int. Cl. B67d *5/06*
U.S. Cl. 222—23 **2 Claims**



A timed feeding mechanism suitable for dispensing food or other granular material to fish or other pets or larger animals at predetermined time intervals and in prescribed quantities, comprising a housing defining an inlet opening and an outlet opening, a receptacle movable between the inlet and outlet openings, a hopper communicating with the inlet opening of the housing for supplying the granular material to the housing, and a timing mechanism for moving the receptacle back and forth between the inlet and outlet openings of the housing to dispense the granular material from the hopper through the housing.

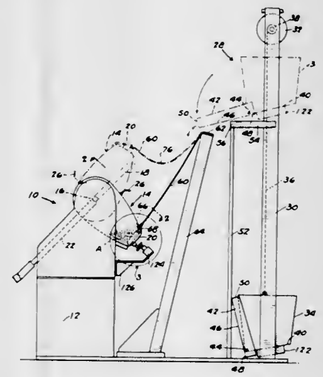
3,578,210
AEROSOL DISPENSING CONTAINER WITH RESERVE PROPELLANT CHAMBERS
Thomas B. Pitrolffy-Szabo, 728 Belmont St., Watertown, Mass. 02172
Filed Jan. 12, 1970, Ser. No. 2,276
Int. Cl. B67d *5/08*
U.S. Cl. 222—52 **6 Claims**

An aerosol dispensing container of the gas-propelled type which includes a plurality of reserve chambers for the propellant gas which are adapted to sequentially release their con-



tained reserve gas supply as the pressure of the propellant gas in the main chamber drops below a predetermined level.

3,578,211
LOADER FOR RECIPROCATING HOPPER
Richard T. Coapman, and Gary D. Ginther, Troy, Mich., assignors to Clyde Corporation, Troy, Mich.
Filed Dec. 31, 1968, Ser. No. 788,270
Int. Cl. B67d *5/08*
U.S. Cl. 222—56 **25 Claims**

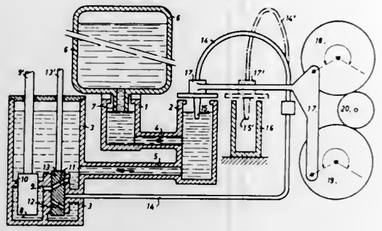


A flexible band forms a chute by which articles are delivered to a vertically oscillating hopper from an elevated container while the hopper is in motion. A spring-supported pressure plate within the hopper is depressed by impacts of the articles within the hopper thereon only until the supply falls below a predetermined minimum and thereafter remains undepressed, thereby actuating a motor which causes transfer of additional articles from the elevated container onto the chute for automatically replenishing the supply of articles in the hopper.

3,578,212
LIQUID DOSAGE APPARATUS
Rudolf Greiner, and Rudolf Oberli, Langenthal, Switzerland, assignors to Greiner Electronic AG, Langenthal, Switzerland
Filed Nov. 14, 1969, Ser. No. 876,782
Claims priority, application Sweden, Mar. 31, 1969, 4833/69
Int. Cl. B67d *5/16*
U.S. Cl. 222—71 **8 Claims**

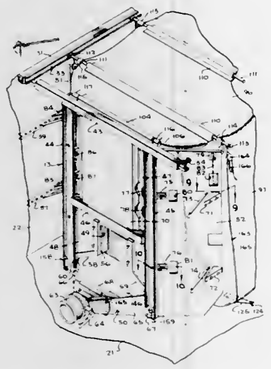
Liquid dosage dispensing apparatus, characterized by the combination of means for pumping a selected quantity of liquid from constant liquid level container means to a discharge nozzle, and nozzle positioning means for displacing the nozzle from an initial storage position in which the nozzle

is partially submerged in the container liquid to a dispensing position relative to a liquid receiver. The dosage pump means include reciprocatory piston means alternately operable to draw, by suction, a desired volume of liquid into a chamber



and to discharge this desired volume from the chamber. Slide valve means are provided that tee operable in synchronism with the piston to connect the chamber alternately with the container and with the nozzle means, respectively.

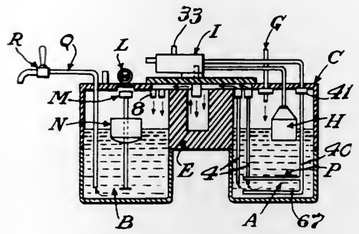
3,578,213
CONTAINER WITH DISPENSING MEANS FOR TRANSPORTING BULK MATERIALS
Edwin E. Clarke, 651 S. 31st St., Allentown, Pa., and Albert J. Florig, 1549 Yost St., Norristown, Pa.
Filed Jan. 28, 1969, Ser. No. 794,591
Int. Cl. B65d *35/30*
U.S. Cl. 222—95 **32 Claims**



A container for transporting bulk materials including a rigid enclosure means, partition means disposed in the rigid enclosure means, and being movable along a length of the rigid enclosure means to provide a variable volume chamber, a flexible enclosure means disposed in the variable volume chamber, the rigid enclosure means having discharge means and the flexible enclosure means having outlet means communicating with the discharge means of the rigid enclosure means.

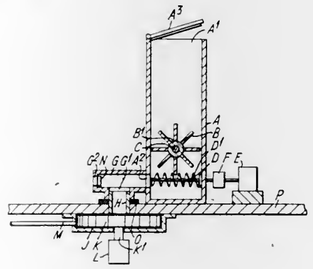
3,578,214
CARBONATOR
Frank M. Iannelli, 5 Penwood Road, Livingston, N.J.
Filed Feb. 7, 1969, Ser. No. 797,462
Int. Cl. B67d *5/56*
U.S. Cl. 222—129.1 **5 Claims**

Liquid to be carbonated flows under its normal pressure into a combined reservoir and precarbonating chamber and is forced from said chamber by carbonating gas into a combined mixing and dispensing chamber. The supply of carbonating gas to said reservoir and carbonating chamber is controlled by an electromagnetic valve which is actuated by a float-operated switch in accordance with variations in the liquid level in the mixing and dispensing chamber. Constant gas pressure is supplied through a restricted duct to the mixing and dispensing chamber so that if the chamber empties and the switch cuts off the gas supply, resumption of the flow



of water into said chamber is automatically effected by simply holding the dispensing valve open to reduce the pressure so as to allow the water to flow in until the float closes the switch to cause restoration of the gas pressure.

3,578,215
POWDER DELIVERY ARRANGEMENTS
Roger B. Bushnell, Ashford, Middlesex, England, assignor to Controsion Electrostatic Limited, London, England
Filed July 7, 1969, Ser. No. 839,502
Claims priority, application Great Britain, July 15, 1968, 33637/68
Int. Cl. B67d *5/54*
U.S. Cl. 222—193 **5 Claims**



This invention relates to a powder delivery arrangement, for example for the delivery of powdered paint to a spray gun for the spray coating of surfaces, and comprises a hopper into which the powder is introduced, a stirring device in the hopper for preventing clogging of the powder, a worm shaft in the hopper for driving the powder received from the stirring device out from the hopper into a chamber containing a centrifugal fan which sucks the powder received from the hopper and drives it through a delivery pipe. The powder expelled from the hopper may conveniently be delivered into an intermediate compartment having an air inlet preferably provided with a filter device, the centrifugal fan acting to suck a mixture of powder and air from such compartment The hopper together with the stirring device and worm shaft within it is preferably removably mounted for interchange with alternative hoppers. The stirring device and the worm shaft are preferably driven by a variably speed motor.

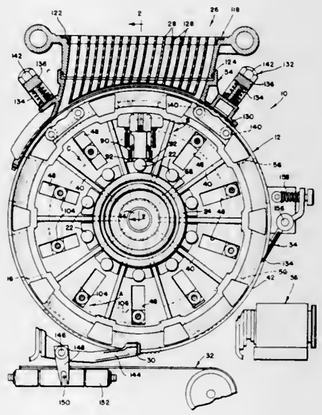
3,578,216
PREVENTION OF ARCHING COMPACTION OF DISCRETE MATERIAL IN GRAVITY FEED HOPPERS
William S. Pearson, 225 N. First St., Hampstead, Md.
Filed Dec. 3, 1968, Ser. No. 780,708
Int. Cl. B65g *3/12, 69/06*
U.S. Cl. 222—195 **10 Claims**

Arching compaction of discrete material in gravity feed

hoppers is prevented by directing a stream of fluid upwardly

from adjacent to the discharge outlet of the hopper.

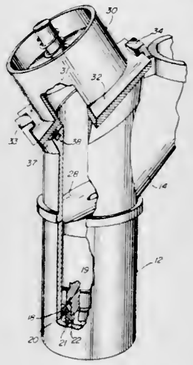
3,578,217
FLUENT MATERIAL DISPENSING DEVICE HAVING ROTARY TRAP CHAMBERS WITH RADIALLY MOVABLE EJECTOR
Roland E. Miller, Orangeville, Ill., assignor to Kraftco Corporation
Filed May 15, 1968, Ser. No. 729,356
Int. Cl. G01f *11/00*
U.S. Cl. 222—218 **19 Claims**



A device is provided for dispensing metered quantities of material and includes a wheel defining circumferentially spaced chambers extending radially inwardly from the periphery of the wheel, a plunger within each of the chambers, and means for selectively adjusting the extent of radial movement of the plungers within the chambers so as to permit selective control of the amount of material dispensed from each chamber.

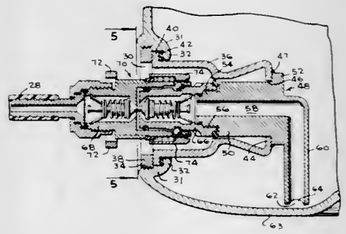
3,578,218
VACUUM SEAL FOR DOUGH DIVIDERS
Harold Thomas Atwood, Chicago, Ill. (14152 Irving Ave., Dolton, Ill. 60419)
Filed Mar. 6, 1969, Ser. No. 804,858
Int. Cl. B67d *5/40*
U.S. Cl. 222—383 **1 Claim**

A vacuum seal is provided in an open top tubular cylinder by a pair of sealing rings mounted respectively on a piston that is reciprocated in the cylinder, and in an annular groove in the upper edge of the cylinder. The sidewall of the cylinder is provided with an inlet opening in flow communication with a hopper from which material, such as dough, for example, is fed into the cylinder above the top of the piston. A metal plate having a flat bottom slides laterally of the cylinder with its flat bottom held in the plane of the open



upper end of the cylinder. The metal plate fits against the upper edge of the cylinder and covers its upper end during the downward movement of the piston. The two sealing rings cooperate to seal the cylinder above and below the inlet opening, so that as the piston moves downwardly in the cylinder, it produces sufficient suction to force the dough from the hopper through the inlet opening into the cylinder.

3,578,219
QUICK-CONNECT COUPLING CONVERSION MEANS FOR BEER KEGS
Harry E. Berry, 3510 S. W. 32nd Ave., Hollywood, Fla.
Filed May 1, 1969, Ser. No. 821,057
Int. Cl. B65d *83/00*
U.S. Cl. 222—394 **5 Claims**

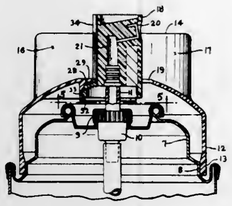


A keg having a lower liquid dispensing tapping opening provided with a removable adapter mounted in a valve body cup and having a downwardly extending radial conduit on its innermost end with the conduit having an inlet opening adjacent the bottom of the keg on one end and communicating with a male quick-connect coupling member on its other end for the discharge of liquid through the coupling for enabling a maximum efficiency in the discharge of the keg contents.

3,578,220
AEROSOL VALVE ACTUATOR AND CAP COMBINATION
Derek Bernard Green, Bedford, N.H., and Gordon Edwin Kaye, South Salem, N.Y., assignors to Scovill Manufacturing Company, Waterbury, Conn.
Filed Mar. 17, 1969, Ser. No. 807,618
Int. Cl. B65d *83/14*
U.S. Cl. 222—402.13 **4 Claims**

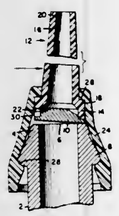
An aerosol valve actuator button is held in preliminary assembly with an overcap so that the button is maintained cor-

rectly oriented with respect to features of the cap intended to restrict the operation of the button to one direction only. In the preliminary assembly, the button is in a raised position al-



lowing the cap to be fitted to the container without engaging the valve stem. Downward movement of the button will snap it out of the retaining portion of the cap and seat it on the valve stem.

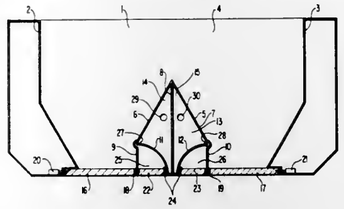
3,578,221
AEROSOL CONTAINER WITH PUSH-ON CLOSURE AND NOZZLE
Heinz Lukesch; Hans Krakowsky, and Dieter Heeb, Hamburg, Germany, assignors to Firma Hans Schwarzkopf, Hamburg, Altona, Germany
Filed Feb. 28, 1969, Ser. No. 803,174
Claims priority, application Germany, Mar. 6, 1968, P 16 75 564.9
Int. Cl. B65d *83/06*
U.S. Cl. 222—402.22 **8 Claims**



An aerosol container having a cylindrical neck defining an outlet opening. A nozzle having a base and neck seats on the container neck with its base covering the outlet opening, and is held in place by a push-on cap snapped onto the container, with the nozzle neck projecting through a hole in the cap. The cap is resilient, so that when the nozzle is pushed sideways, the cap yields and the nozzle base lifts to uncover the outlet opening. The container contents then pass through the uncovered outlet opening, through a peripheral space between the nozzle base and the cap, through a side bore in the nozzle base, and out a passage in the nozzle neck as a spray.

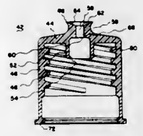
3,578,222
HOPPER WITH BOTTOM DOOR ACTUATOR
Hendrik Pot, Kinderdijk, Netherlands, assignor to N. V. Industrieele Handelscombinatie Holland, Rotterdam, Netherlands
Filed Aug. 22, 1969, Ser. No. 852,179
Claims priority, application Netherlands, Aug. 23, 1968, 68.12073
Int. Cl. B67d *3/00*
U.S. Cl. 222—504 **3 Claims**

A hopper has a bottom door which is pivoted intermediate its length about a horizontal axis. That portion of the hopper door which is on the side of the pivot axis opposite the hold is disposed in a part-circular chamber in which it functions as a radial piston, the application of fluid pressure to the



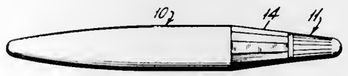
chamber above the piston serving to swing the door vertically.

3,578,223
CONTAINER WITH CLOSURE
Donald F. Armour, Bloomfield, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Aug. 27, 1968, Ser. No. 755,693
Int. Cl. B67d *3/00*
U.S. Cl. 222—521 **4 Claims**



A container closure assembly including a fitment secured to the outside of the neck of a resilient plastic bottle having a dispensing channel therein communicating with an outlet passage in a cap which is threaded onto the neck over the fitment. The assembly has dual seals against leakage and a self-cleaning outlet achieved by means of a wiping type of contact between a pin on the fitment and the surface of the cap opening as the cap is rotated toward its closed position. The outlet passage may be provided with channels to augment its size and provide for varying the discharge rate.

3,578,224
CONTAINER AND CLOSURE CAP
Marvin S. Greenhut, Massapeque, N.Y., assignor to Grow Chemical Corp, New York, N.Y.
Filed July 25, 1968, Ser. No. 747,510
Int. Cl. B65d *47/00*
U.S. Cl. 222—546 **4 Claims**



The invention contemplates a plastic bottle or container for the storage and selective dispensing of fluent material, such as liquid adhesive, through a dispensing opening at the end of an outwardly projecting neck. Interfitting cap and neck parts establish and assure sealing when the container is closed. The cap includes a central projecting stem which achieves a sealing interference fit with the opening, and the skirt of the cap is relied upon to engage and secure the cap to the base of the neck.

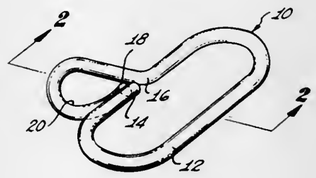
ERRATUM

For Class 224—4 see:
Patent No. 3,578,208

3,578,225
CONCEALED PURSE: HIDE-A-PURSE
Stella Mae Schroeder, 141 W. 4th St., Davenport, Iowa
Filed Apr. 4, 1969, Ser. No. 813,596
Int. Cl. A45c *1/04*
U.S. Cl. 224—5-R **1 Claim**

In accordance with my invention a strap is adapted to be detachably secured to the shoulder of a wearer and worn under a coat or jacket. The strap extends downwardly toward the waist and at its lowest point is provided with one or more fastener means. A purse, which can be hand carried in conventional manner, is provided with a like plurality of fastening means which are adapted for detachable engagement with the fastener means. As a result, the purse can be held next to the waist by the straps, out of sight, and inaccessible to would-be thieves and purse snatchers.

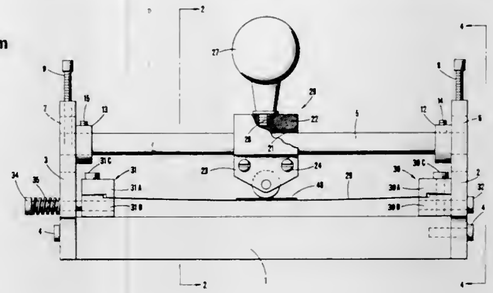
3,578,226
HAND TOTE DEVICE FOR GARMENTS ON CLOTHES HANGERS
Frederick H. Good, 2429 Via Sonama, Palos Verdes Estates, Calif.
Filed Mar. 19, 1969, Ser. No. 808,489
Int. Cl. A47g *25/06*
U.S. Cl. 224—45 **3 Claims**



A rigid rodlike element has one end shaped to provide an opening to receive the hook ends of clothes hangers. The remainder of the element is shaped to form a hand grip portion which is at right angles to and spaced from the opening. The opening for the hanger hooks may be constituted of a loop formed in the element, or such one end of the element may be flattened and have a slot formed therein.

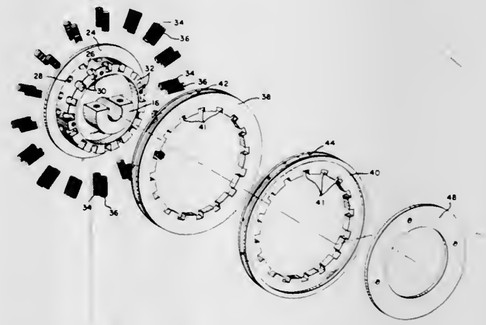
3,578,227
METHOD OF BREAKING DICE
Aime A. Gehri, Beverly, Mass., assignor to Transitron Electronic Corporation, Wakefield, Mass.
Continuation of application Ser. No. 696,433, Jan. 8, 1968, now abandoned. This application Oct. 1, 1969, Ser. No. 868,961
Int. Cl. B26f *3/00*
U.S. Cl. 225—2 **9 Claims**

A means for breaking a semiconductor wafer that has been scored into a plurality of individual dice consisting of a roller mounted on a longitudinally extending shaft adapted to roll over a sandwich containing a scored wafer and a flexible



band of metal longitudinally tensioned and positioned in alignment with and below the shaft.

3,578,228
APPARATUS FOR FEEDING TWO WIRES SIMULTANEOUSLY
Charles Dale Steiner, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Nov. 6, 1969, Ser. No. 874,430
Int. Cl. B65h *17/42*
U.S. Cl. 226—109 **4 Claims**

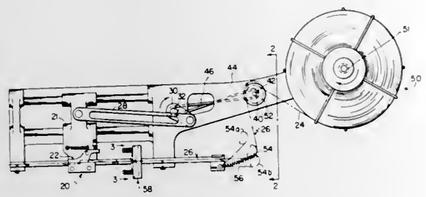


Wire feeding means comprises a pair of feed wheels mounted on parallel spaced-apart axes. One of the wheels has two tires mounted in side-by-side relationship on its periphery, each tire being adapted to engage one of two wires being fed. The tires are supported on the periphery of the wheel by means of helical springs which extend radially with respect to the axis of the wheel. These springs can be compressed and also can be deflected laterally thereby to permit the tires to feed different sizes of wires and to provide a resilient coupling between the tires and the wheel on which they are mounted.

3,578,229
BOOSTER ROLL FOR INTERMITTENT FEEDS
James Keith Macomber, Rockville Centre, N.Y., assignor to Consolidated Educatinonal Publishing, Inc.,, Long Island, N.Y.
Filed Apr. 5, 1968, Ser. No. 719,028
Int. Cl. B65h *17/36*
U.S. Cl. 226—114 **11 Claims**

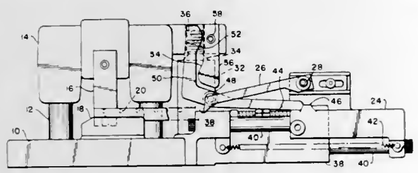
This invention relates to supply means for web or ribbon feed machines where the ribbon is unreeled from a storage supply means such as a reel in substantially continuous motion, and is fed through the mechanism of the machine by an intermittent motion. The purpose of the invention is to pro-

vide mechanical filter means cooperating with a booster assist drive connected to the main drive of the device to translate the intermittent motion of the feed of the machine to a smooth, continuous motion at the supply means or reel for the ribbon. In the preferred form of the invention, the booster is a cylindrical roll in the ribbon pathway adapted to



frictionally engage the ribbon, and the mechanical filter comprises a ribbon holding means, or brake, to prevent the ribbon from reversing its motion, and a coercing member, such as a tension member, spring urged against the ribbon within the ribbon pathway, between the ribbon holding means and the booster roll, as will be more fully described and claimed hereinbelow.

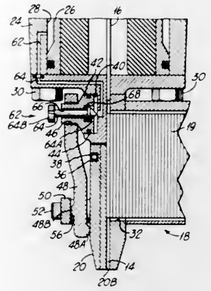
3,578,230
PRESS FEED CONTROL
Joseph W. Baldyga, Utica, Mich., assignor to Diamond Die & Mold Co., Mount Clemens, Mich.
Filed Sept. 8, 1969, Ser. No. 855,847
Int. Cl. B65h *17/04*
U.S. Cl. 226—162 **11 Claims**



A press feed control comprising a pair of interconnected hydraulic cylinders, a piston in one cylinder mechanically operated by press actuation to displace fluid which in turn displaces the piston in the timing cylinder, which piston is connected to feed mechanism. Resilient means urge the feed mechanism in the direction tending to move the piston in the timing cylinder to return fluid to the first cylinder. A check valve and an adjustable metering valve are provided in the connection between the cylinders.

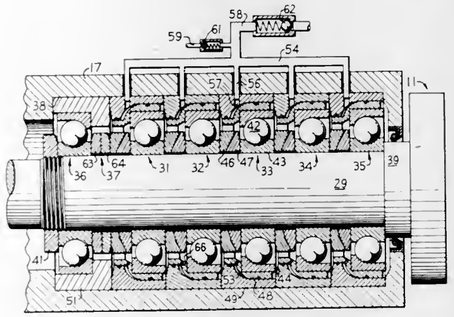
3,578,231
FASTENER DRIVING TOOL WITH PNEUMATICALLY CLAMPED NOSEPIECE STRUCTURE
Edward J. Novak, Franklin Park, Ill., assignor to Fastener Corporation, Franklin Park, Ill.
Filed Feb. 5, 1970, Ser. No. 8,915
Int. Cl. B25c *5/06*
U.S. Cl. 227—123 **14 Claims**

A pneumatic fastener driving tool using a compressed air driven fastener driver includes a housing supplied with compressed air. A nosepiece on the housing forms a drive track for the driver to which fasteners are supplied below the driver. An opening through the nosepiece into the drive track is closed by a movable closure held in place by a pneumatic clamping assembly. This assembly includes a piston and cylinder supplied with compressed air from the housing for biasing a lever engaging the closure. A manually actuated release valve in the piston releases the bias to permit movement of the closure to clear jams. A fulcrum for the lever is



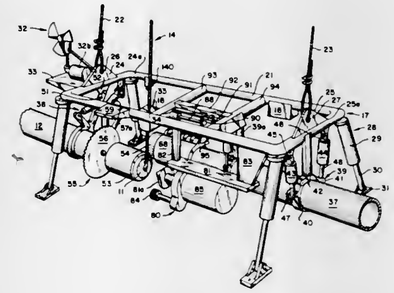
also removable to permit opening of the closure to clear difficult jams.

3,578,232
HYDRAULICALLY LOADED THRUST BEARING ARRANGMENT FOR A FRICTION WELDING MACHINE
Calvin D. Loyd, Peoria; Theodore L. Oberle, Washington, and Ronald L. Satzler, Metamora, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Dec. 20, 1968, Ser. No. 785,644
Int. Cl. B23k *27/00*
U.S. Cl. 228—2 **8 Claims**



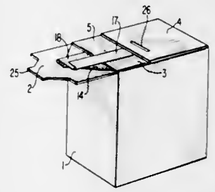
A thrust bearing arrangement for use with a shaft which is subject to high rotational speeds and high axial thrust relative to a supporting housing. A number of angular contact thrust bearings are arranged in tandem between the shaft and housing and are independently pressurized by hydraulic fluid for developing equal internal counterbalancing pressure in the bearings. The internal counterbalancing force developed within each bearing is preferably somewhat in excess of the axial force transmitted between the shaft and housing with resilient backup means absorbing at least a portion of the internal counterbalancing force and axially stabilizing the shaft relative to the housing. The bearing arrangement is adaptable to a friction welding machine for use with its spindle and spindle housing with working fluid from a common source delivered both to the bearing and to a hydraulic load cylinder for developing the axial load.

3,578,233
APPARATUS FOR REMOTELY JOINING UNDERWATER PIPELINES
Robert P. Meister; James S. Glasgow; Donald J. Hackman; Milton D. Randall, Columbus, Ohio, and John K. McCarron, Houston, Tex., assignors to Shell Oil Company, New York, N.Y.
Filed July 11, 1968, Ser. No. 744,161
Int. Cl. B23k *1/20*
U.S. Cl. 228—5 **24 Claims**



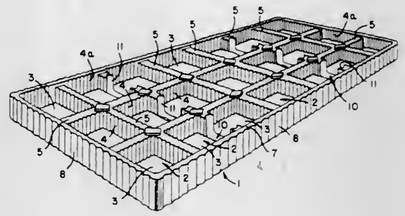
A technique for joining pipelines underwater comprising joint preparation and completion apparatus that is either remotely operated or automatically sequenced. The apparatus is adapted to be used with three alternate embodiments of joining means: (1) a mechanical connection, (2) thermit welding, or (3) a combination of explosive-forming and mechanical joining.

3,578,234
LINED SHIPPING CONTAINER
Joseph Marchisen, Hightstown, N.J., assignor to Union Camp Corporation, New York, N.Y.
Filed Aug. 1, 1969, Ser. No. 846,750
Int. Cl. B65d *5/56*
U.S. Cl. 229—14BA **1 Claim**



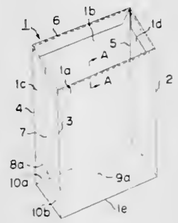
A shipping container comprising a carton and a liner bag therein. The open end of the bag extends above the horizontal plane of the closing flaps of the carton to an extent exceeding the width of a flap. The top of the bag is closed by elongating and bringing together opposite sides to form a flexible body longitudinally parallel to and extending between two opposing flaps of a pair. The carton and bag are simultaneously closed and a substantially tight seal for the bag is formed by first infolding one of the flaps of the pair, and thereby the body. Thereafter, the opposing flap of the pair is infolded, which also folds the body again and interleaves the body between the two flaps to form two longitudinal closure folds. The body may be of sufficient length to be folded over the second flap to form an additional closure fold. Finally, the flaps of the other pair are infolded whereby the folded body projecting over these flaps is infolded to form transverse closure folds.

3,578,235
TRAY FOR CARMELS
Hugh R. Weiss, Montclair, N.J. (c/o The Pantasote Co., 26 Jefferson St., Passaic, N. J. 07055)
Filed Nov. 5, 1969, Ser. No. 874,240
Int. Cl. B65d *1/36, 1/00*
U.S. Cl. 229—15 **1 Claim**



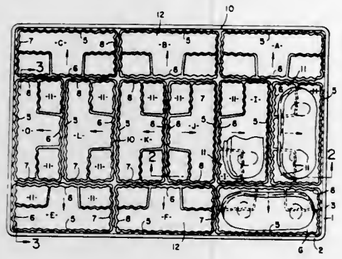
A one-piece multicavity tray suitable for receiving, supporting and displaying high density candies which tend to flow in warm climates, has smooth bottom surface cavities, partitions of inverted U-shape section separating cavities, a continuous lateral peripheral flange terminating in a fluted skirt for supporting the peripheral cavities well off the bottom of the box in which to loaded trays are placed, and in place of the rippling or ribbing usually used in the bottoms of the cavities, internal support for the tray is provided by forming a plurality of distributed steps which extend downwardly from intermediate portions of the partitions below the plane of the bottom of the cavities to bear against the bottom of the said box.

3,578,236
PAPER BAG OF SIMPLIFIED STRUCTURE ADAPTED TO BE RETAINED IN EACH OF THE OPENED AND THE FOLDED CONFIGURATIONS
Masayuki Arai, Tokyo, Japan, assignor to Lyric Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 21, 1969, Ser. No. 809,291
Claims priority, application Japan, July 16, 1968, 43/61141
Int. Cl. B65d *33/02*
U.S. Cl. 229—55 **3 Claims**



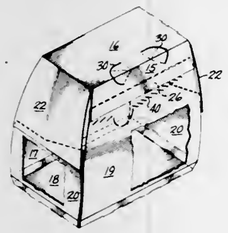
A paper bag having a substantially rectangular cross section and made of a single tough but cheap paper material and provided with a flexible and tough reinforcement wire or band lined along the entire open top edges and also with intermediate vertical folding lines in the side panels, at least one horizontal folding line extending around the vertical panels in the lower portions of these panels, inclined folding lines extending inwardly from the corners of the bottom side edges to join the point of intersection of said intermediate vertical folding line and said horizontal folding line, and at least one longitudinal central folding line in the bottom panel, whereby said paper bag may be retained in each of the opened and the closed configurations by virtue of said reinforcement means.

3,578,237
TRAY FOR DISPLAYING AND PROTECTING CANDY AND THE LIKE
Hugh R. Weiss, Montclair, N.J. (c/o The Pantasote Company, 26 Jefferson St., Passiac, N.J. 07055)
Filed Nov. 5, 1969, Ser. No. 874,241
Int. Cl. B65d *1/36, 1/00*
U.S. Cl. 229—15 **2 Claims**



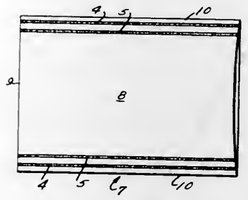
A one-piece multicompartment tray for protecting frangible cookies or candy has a plurality of rectangular compartments surrounded by a continuous relatively thick peripheral lip, ribs formed by adjacent walls of adjacent compartments and having a relatively thick upper portion separate adjacent compartments, some of the ribs extending to and intersecting with said peripheral lip, each of the compartments is fitted with a boss attached to two adjacent walls of the compartment, an upper surface of said boss is tilted downwards toward a boss-free wall of the cavity and toward the nearest peripheral edge of the tray that is parallel to the boss-free wall of the cavity.

3,578,238
CONTAINER WHICH COMPLETELY ENCLOSES ARTICLES
Joseph F. Schillinger, Chicago, and Thomas B. Moser, Glen Ellyn, Ill., assignors to Weyerhaeuser Company, Tacoma, Wash.
Continuation of application Ser. No. 710,120, Mar. 4, 1968, now abandoned. This application July 28, 1969, Ser. No. 848,402
Int. Cl. B65d *5/02, 85/00*
U.S. Cl. 229—40 **11 Claims**



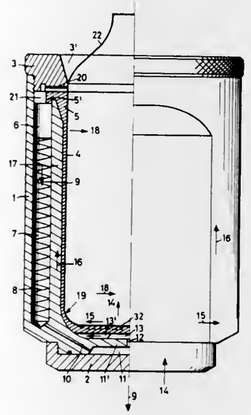
A carton or container which fully encloses the contained articles. The carton has finger holes placed along one side edge of the carton allowing one of the articles to be grasped when the carton is carried by use of the finger holes. There are no cutouts for the caps or base of the articles, so that the container tightly encloses them. The container has a design which allows the container blanks to be nested on the web prior to cutting.

3,578,239
BAG STRUCTURE
Sol J. Perlman, Baltimore, Md., assignor to Vac Pac Manufacturing Company, Inc., Baltimore, Md.
Continuation-in-part of application Ser. No. 630,961, Apr. 14, 1967, now Patent No. 3,478,952. This application July 17, 1969, Ser. No. 842,570
Int. Cl. B65d *31/00, 33/00*
U.S. Cl. 229—53 **6 Claims**



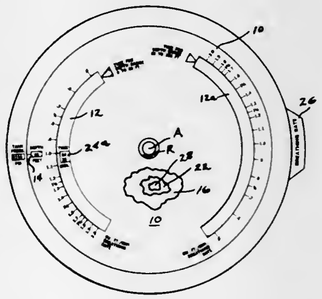
An improved method of adhering the bottom of polyalkylene terephthalate film bags, such as those used to shrink package frozen turkeys, is disclosed. The bags are adhered on at least one side with two distinct adhesive bands. The inner band is a thermoplastic adhesive which allows a measure of "peelability and shock absorbability," whereas the outer adhesive band is a high strength thermosetting adhesive. The contained product may even be cooked within the bag.

3,578,240
RECEPTACLE HOLDER FOR CENTRIFUGES
Gunter Eberle, Gartenstrasse 100, Postrach 391, 72 Tuttlingen, Germany
Filed Apr. 14, 1969, Ser. No. 815,912
Claims priority, application Germany, Apr. 13, 1968, P 17 73 198.5
Int. Cl. B04b *9/12*
U.S. Cl. 233—26 **5 Claims**



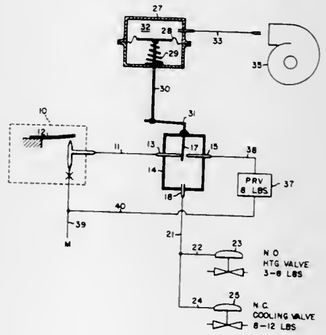
A holder for a receptacle such as a blood-containing receptacle which is to be centrifuged. The holder includes an outer wall structure which is lined by an inner flexible lining. The outer wall structure is formed with axial bores in which hydraulic pistons are respectively slidable. The outer wall structure and the flexible liner define between themselves a chamber of a predetermined configuration for receiving a compensating hydraulic liquid which is acted upon by the pistons which slide in the bores in response to centrifugal forces which are present during the centrifuging operations. With this construction the configuration of the chamber is such that the hydraulic liquid is displaced by the pistons during centrifuging in such a way that horizontal and radial forces which otherwise would act on the receptacle during centrifuging thereof are eliminated with the compensating hydraulic liquid.

3,578,241
SLIDE RULE FOR SCUBA DIVERS
Philip J. Wombough, 4255 Ocean Blvd., and Charles E. Tallerino, 3717 Yosemite, Pacific Beach, Calif.
Filed Oct. 16, 1969, Ser. No. 866,806
Int. Cl. G06c *3/00*
U.S. Cl. 235—88 **11 Claims**



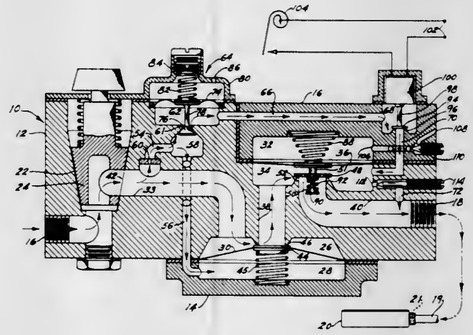
A circular slide rule for use by scuba divers which coordinates the variables of air tank pressure, depth of submergence, breathing rate, and time and with which a variable may be determined when the others are known. The time available at depth is disposed on a scale formed as two separate parts, the first being from surface to an intermediate depth and the other from the intermediate depth to maximum depth which provides greater accuracy at greater depths, where it is most needed. The discs of the slide rule are flexible and of various diameters permitting the selective locking together of different combinations of same by the fingers of the user.

3,578,242
PNEUMATIC AIR-CONDITIONING CONTROL SYSTEM
Donald H. Spethmann, Arlington Heights, Ill., assignor to Honeywell, Inc., Minneapolis, Minn.
Filed Sept. 3, 1969, Ser. No. 854,937
Int. Cl. G05d *23/19*
U.S. Cl. 236—1 **5 Claims**



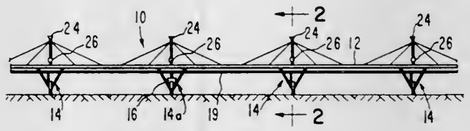
A pneumatic control system controlling sequentially operable valves, including a pressure-responsive pneumatic switch operable in response to the operation of the central fan or blower of the air-conditioning system. This switch connects the thermostat to the valves when the blower or fan is operating, connects a pressure reducing valve to the valves of the air-conditioning system when the fan is not operating, and provides a control pressure suitable for holding the valves in the desired position for nonoperation.

3,578,243
STEPPED-FLOW GAS VALVE
John J. Love, St. Louis, Mo., assignor to Emerson Electric Co., St. Louis, Mo.
Filed June 13, 1969, Ser. No. 833,113
Int. Cl. G05d *23/185*
U.S. Cl. 236—80 **6 Claims**



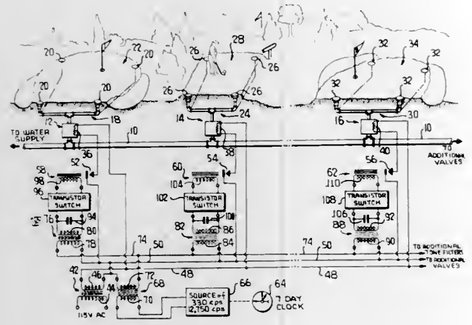
Two, series arranged, biased closed valves in a fuel passageway and a bypass around the downstream valve to provide a partial flow when the upstream valve is open and the downstream valve is closed, the downstream valve being opened by the fluid pressure in the passageway between the valves when the upstream valve is open and the opening of the downstream valve being delayed so as to provide a partial flow of fuel for a short period following the opening of the upstream valve.

3,578,244
INTERMITTENT SPRINKLER IRRIGATION SYSTEM
Lennart G. Erickson, San Mateo, Calif., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Apr. 14, 1969, Ser. No. 815,596
Int. Cl. A01g *25/02*
U.S. Cl. 239—1 **6 Claims**



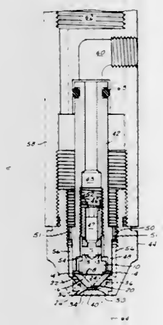
Irrigation apparatus and method utilizing substantially constant waterflow through a lateral and sequential operation of sprinkler heads mounted on and in selective fluid communication with the lateral to provide cyclic irrigation at each of a number of operative locations along the lateral. The constant waterflow and sequential operation of the heads allows for reductions in cross section of the lateral and permits fewer but larger heads to be used, whereby equipment costs are reduced and greater land areas can be irrigated. The heads are selectively placed in fluid communication with the lateral by the use of remotely controlled valves.

3,578,245
ELECTRICALLY CONTROLLED FLUID DISTRIBUTION SYSTEM
Glover B. Brock, 3709 8th St. South, Arlington, Va.
Filed July 29, 1969, Ser. No. 845,740
Int. Cl. A01g *25/02*
U.S. Cl. 239—66 17 Claims



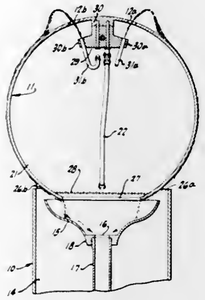
A fluid distribution system is shown which includes a plurality of electrically actuated valves. Each valve is associated with a selectively activated switching device responsive to a particular control signal of preselected frequency. A bandpass filter is connected between each switching device and a source of control signals having differing frequencies and preselected durations for activating the switching devices. The source of control signals may be a source of prerecorded signals, such as a replacable cassette, or a preprogrammed oscillator arrangement.

3,578,246
SPRAYING PROCESS
Orvis A. Davis, Sr., Gibsonia, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
Division of Ser. No. 687,236, Dec. 1, 1967, abandoned, which is a division of Ser. No. 524,672, Feb. 3, 1966, Pat. No. 3,373,941. Filed Oct. 16, 1969, Ser. No. 866,935
Int. Cl. B05b *7/06*
U.S. Cl. 239—8 6 Claims



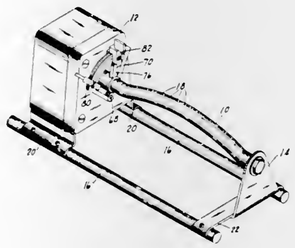
A spray having a generally circular cross section is modified into one having an oblong cross section. A pair of pressurized fluid streams are charged in a collision course directly into each other on one side of said spray while a second pair of pressurized fluid streams are charged in a collision course directly into each other on the diametrically opposite side of said spray. Said pairs of fluid streams compress the circular cross section of said spray into an oblong cross-sectional configuration.

3,578,247
SPHERICAL WATER FOUNTAIN
Allen C. Wright, Moraga, Calif., assignor to Haws Drinking Faucet Company, Berkeley, Calif.
Filed Nov. 21, 1968, Ser. No. 777,650
Int. Cl. E03b *9/20*
U.S. Cl. 239—29 5 Claims



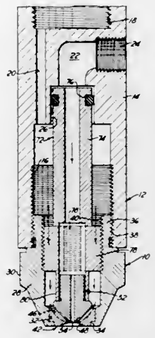
A water fountain comprising a pedestal supporting a spherical head thereon having spaced ports along the surface thereof respectively adapted to have a valve-controlled stream of water discharge therefrom. Water issuing from the ports falls downwardly onto the convex spherical surface of the head and is carried thereby into a bowl or receiver located beneath the head and within the pedestal. Substantially all of the functional components of the fountain are concealed within the hollow spherical head and hollow pedestal so as to minimize vandalism of such components and misuse of the fountain.

3,578,248
FLUID SPRINKLER HAVING MEANS FOR DRIVING AND REVERSING AN OSCILLATING DISTRIBUTING TUBE OF UNIFORM SPEED
George L. Congdon, Fort Atkinson, and Fred W. Kufrin, Janesville, Wis., assignors to Western Industries, Inc., Milwaukee, Wis.
Filed July 16, 1969, Ser. No. 842,124
Int. Cl. B05b *3/16*
U.S. Cl. 239—242 6 Claims



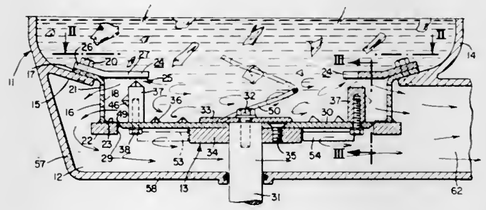
A fluid sprinkler having an oscillating water tube that moves with a uniform velocity through an arc of adjustable length, including a fluid turbine connected to the distributing tube for oscillating the tube of a uniform velocity and depositing a predetermined amount of water per unit area of ground regardless of water pressure or the length of oscillatory swinging movement of the water tube. The means for oscillating the tube includes a directional flow valve means connected to the tube for instantly reversing the direction of swing of the tube.

3,578,249
FLAT SPRAY ASPIRATING NOZZLE
Orvis A. Davis, Sr., Gibsonia, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
Filed Mar. 5, 1969, Ser. No. 804,450
Int. Cl. B05b *1/28*
U.S. Cl. 239—296 7 Claims



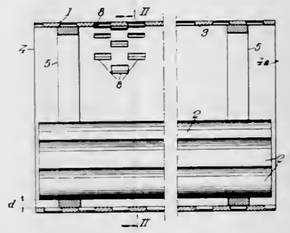
A flat spray nozzle utilizing two flows, which may be of two different fuels, or of a fuel and air, and one or both of which may be pressurized. The nozzle includes a front end nosepiece which creates a region of low pressure in its exit orifice, and the exit end of the liquid fuel supply is located at that low-pressure region to thereby cause aspiration of the fuel into the gas as it exits from the nozzle in a flat, fan-shaped spray.

3,578,250
PULPING APPARATUS
William H. Combs, Wayne; Sam N. Craig, Devon; Ellis R. Warner, Jr., West Chester, and Wayne T. Buckman, Pipersville, Pa., assignors to Wascon Systems, Incorporated, Hatboro, Pa.
Filed Aug. 9, 1968, Ser. No. 751,536
Int. Cl. B02c *18/12, 18/22, 18/40*
U.S. Cl. 241—46.02 16 Claims



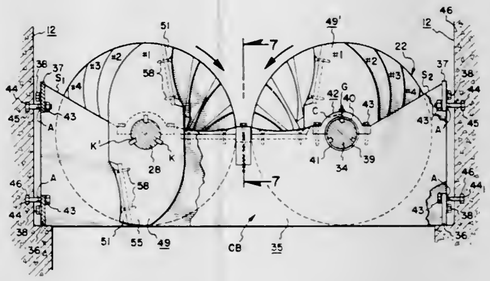
A pulping apparatus is provided, adapted to receive therein solid debris for comminution to a desired size in a liquid medium, such as water, Water and debris are received in the bottom of a tank having a disclike impeller rotatably driven at the bottom thereof and a sizing ring disposed at the bottom of the tank about the impeller whereby, during rotation of the impeller, there is effected a size reduction of solid particles by means of teeth carried by the impeller. Debris which is sufficiently sized passes through holes in the sizing ring an is discharged from the pulping tank. A particularly novel structure is provided for effecting a scissorslike cutting action by means of cutting elements carried by each of the tank and the rotatable impeller. A novel configuration is also provided for the outermost edge of the impelling disc, relative to the sizing ring such that fluid and debris in the tank is driven across their common running clearances passage, rather than through the passage. A ramp is also provided, centrally located relative to the impeller, for preventing balling-up of rags and the like at the center of the impeller.

3,578,251
BAR-TYPE ROTARY CRUSHERS
Leonel Beudin, Paris, France, assignor to Bureau De Recherches Geologiques Et Minieres, Paris, France
Filed May 24, 1968, Ser. No. 731,848
Claims priority, application France, May 26, 1967, 108,129
Int. Cl. B02c *17/02, 17/10, 17/22*
U.S. Cl. 241—74 7 Claims



The crusher has a rotary, generally cylindrical structure, of substantially horizontal axis, which contains free cylindrical or prismatic bars adapted to crush the products introduced into this cylindrical structure. Two girdles are disposed on the interior lateral wall of the cylindrical structures. These girdles form the runway for the bars, and separate the bars from the lateral wall of the cylindrical structure, this separation being greater than the dimensions of the large particles of the products to be crushed.

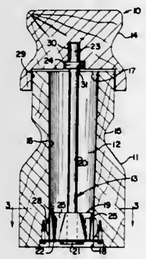
3,578,252
INDUSTRIAL SHREDDING APPARATUS
John C. Brewer, Salt Lake City, Utah, assignor to Garbalizer Corporation of America, Salt Lake City, Utah
Filed Dec. 13, 1968, Ser. No. 783,665
Int. Cl. B02c *18/06*
U.S. Cl. 241—141 22 Claims



The present invention comprises an industrial shredding apparatus which is usable in shredding many types of industrial waste, garbage, trash, and so forth. The shredding apparatus incorporates a pair of oppositely revolving shafts upon which are mounted respective sets of knives or cutting blades disposed such that the tips thereof form, compositely, helixlike configuration relative to each of the respective shafts. The blades are so arranged that they serve both in holding debris for cutting by adjacent blades, and, additionally, for cutting themselves in their own turn. The shredding mechanism is designed such that the cutting is done centrally of the apparatus, with associated structure being designed for urging debris falling thereon toward a central position relative to the apparatus. The device is ideally

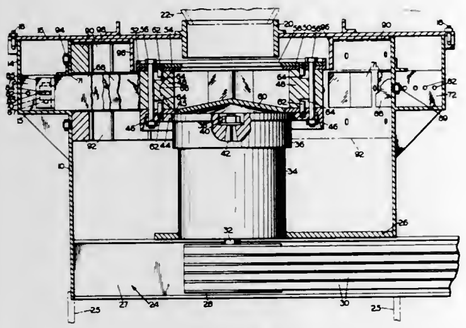
suited for shearing and/or cutting debris and allowing the same to pass through the shredder onto a transport conveyer, for example.

3,578,253
DUAL ROTATION MILL
Arthur Brilliant, Jr., 18 W. 480 Edward, Lombard, Ill.
Filed Oct. 14, 1968, Ser. No. 768,220
Int. Cl. A47j *42/34;* **B02c** *19/12*
U.S. Cl. 241—168 **5 Claims**



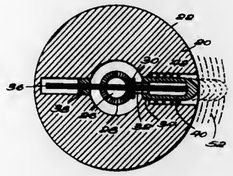
A comminuting apparatus particularly adaptable for use in comminuting seeds such as pepper seeds and coffee beans. The apparatus includes a tubular housing including a comminution member coaxially and rotatably disposed therein. The comminution member is constructed to permit clockwise or counterclockwise rotation.

3,578,254
IMPACT CRUSHER
Bruce V. Wood, 10945 S.E. Clay St., Portland, Oreg.
Filed Sept. 23, 1968, Ser. No. 761,508
Int. Cl. B02c *19/00*
U.S. Cl. 241—275 **5 Claims**



An impact crusher having impeller shoes and anvils capable of easy replacement and furthermore capable of repositioning individually in the crusher as wear occurs. The impeller shoes are triangular in shape for operation in forward or reverse directions of rotation without shifting their position. The anvils are supported on a crusher housing by means of brackets capable of adjustment radially in the housing for repositioning the anvils.

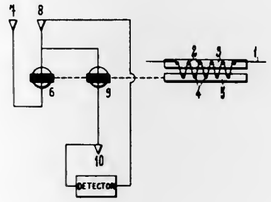
3,578,255
PRODUCTION OF A TWISTLESS PAYOUT PACKAGE WITH MEANS FOR DRAWING OUT THE INNER END OF THE MATERIAL
William F. Gordon, Yonkers, and James W. Newman, Scarsdale, N.Y., assignors to Windings, Inc.
Filed Apr. 23, 1969, Ser. No. 818,731
Int. Cl. B65h *54/02, 49/26*
U.S. Cl. 242—18 **6 Claims**



In winding a package of flexible material formed of a plurality of layers each composed of a number of figure-eight lights in which the crossovers progress around the package therein, in which a radial hole is provided opening into the central core space of the package through which the inner end of the material can be led out for twistless payout, an arrangement is provided for facilitating the withdrawal of the free inner end of the package through the opening after winding. This may be a means for holding a loop or elongated piece of the flexible material in a position where it can be easily fished out through the hole when the package is finished; or an arrangement for feeding a pin to which the inner end of the material is attached out through the hole as the package is wound; or to an arrangement for projecting a member out through the hole from the interior of the mandrel.

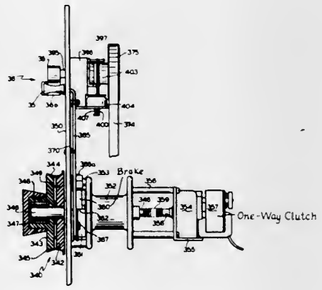
When a pin is fed out through the hole as the package is wound, this pin may protrude beyond the periphery of the package far enough to aid in or to accomplish the formation of the radial hole without the need for speed variations between the spindle and the guide.

3,578,256
YARN BRAKE OF THE SLING TYPE
Geert J. Vermeulen, Deurne, Netherlands, assignor to N. V. Machinefabriek L. te Strake, Deurne, Netherlands
Filed July 29, 1968, Ser. No. 748,341
Claims priority, application Netherlands, Sept. 12, 1967, 6712482
Int. Cl. B65h *63/00, 59/26*
U.S. Cl. 242—36 **6 Claims**



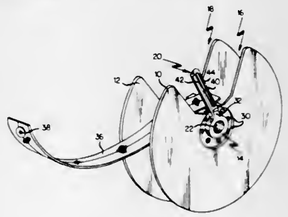
A yarn brake of the sling type comprising a pair of yarn guides each having yarn guide formations. One of the yarn guides is movable and biased for movement away from the other by suitable means such as a coil mechanically coupled to the guide, to which coil direct current is applied and which is suspended in a magnetic field. A second coil in a magnetic field is mechanically coupled to the movable yarn guide for generating a voltage according to the velocity of movement of the guide. The voltage can be applied to a detector which in turn signals undesirably large fluctuations or movements in the guide.

3,578,257
TAPE HANDLING APPARATUS FOR DATA RECORDER
George R. Cogar, Frankfort; Torkjell Sekse, Marcy; Walter Banziger; Joseph W. Ming, Utica, and Laszlo Horvath, Ilion, N.Y., assignors to Mohawk Data Sciences Corporation, Herkimer, N.Y.
Division of Ser. No. 541,450, Mar. 30, 1966, Pat. No. 3,483,-523. Filed Nov. 18, 1968, Ser. No. 786,526
Int. Cl. B65h *17/02*
U.S. Cl. 242—68.3 **5 Claims**



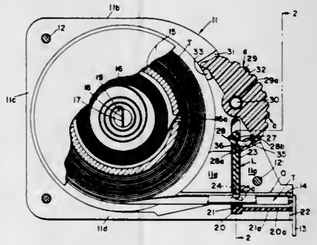
A tape handling system for a data recorder wherein a taper reel is engaged by a holder comprising a pair of circular plates mounted in side-by-side relation and having their edges encircled by a resilient band. One of the plates is fixed on a rotatable shaft with which the other plate is axially movable. The edge of the movable plate tapers outwardly away from the fixed plate so that outward movement of the movable plate causes the resilient band to become disengaged from the movable plate at its maximum dimension. This allows the hub opening of the reel to slip past this maximum dimension and encircle the band and plates. Subsequent inward movement of the movable plate expands the band and causes the reel to become engaged by the holder. The tape handling system also includes means for controlling the rotation of the reel to keep the proper amount of tension on the tape when it is being drawn from the reel. The tape is looped around a guide roller mounted on a pivotable tension arm so that the angular position of the arm indicates the amount of tension on the tape. The arm is connected to a brake band passed around a brake drum located on the reel's shaft to regulate the ease with which the reel may rotate and, thereby, the tension on the tape.

3,578,258
RIBBON SPOOL
Wolfgang Fred Heine, Gronton, and Kenneth D. Vought, Owego, N.Y., assignors to SCM Corporation, New York, N.Y.
Filed Jan. 21, 1969, Ser. No. 792,394
Int. Cl. B65h *75/28*
U.S. Cl. 242—74.1 **7 Claims**



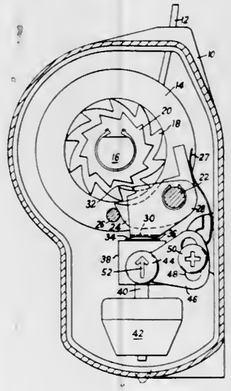
A ribbon spool for a fabric ribbon, carbon ribbon, magnetic ribbon or the like molded from a synthetic material as a single unit including a ribbon attaching element. The ribbon attaching element is integral with the spool by a living hinge construction thereby providing the capability of repetitive movement from a nonribbon attaching position to a ribbon attaching position. The element in cooperation with the spool has a snap-fit construction in the ribbon attaching position to securely attach the ribbon to the spool.

3,578,259
COILABLE RULE LOCKING MECHANISM
Charles Zelnick, Saginaw, and Erwin Schmidt, Bay City, Mich., assignors to Cooper Industries, Inc., Houston, Tex.
Filed May 13, 1968, Ser. No. 728,465
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.2 **15 Claims**



A measuring or like device having a casing with a front wall opening adjacent a bottom wall and a tapeline coilable in the casing and movable out the opening to various projected positions, and wherein an actuator projecting from the front wall of the casing and journaled for pivotal movement from a first pivoted position to a second pivoted position moves a vertically slideable tapeline lock from a position out of braking engagement with the tapeline down to a position in which it resiliently clamps the tapeline against the bottom wall of the casing and holds it in a particular position of extension, cams interconnecting the lock and actuator being operable to cam the lock down to clamp the tapeline when the actuator is pivoted from the first to the second position and to lift the lock up to release the tapeline when the actuator is returned.

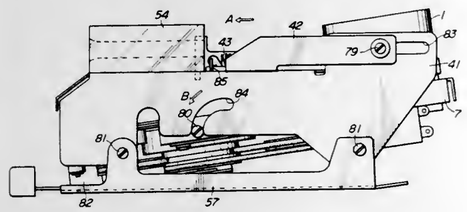
3,578,260
INERTIA REEL MECHANISMS
John Kell, Carlisle, Cumberland, England, assignor to Kangel Magnet Limited, London, England
Filed June 25, 1969, Ser. No. 836,502
Claims priority, application Great Britain, June 27, 1968, 30,816/68
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.4 **8 Claims**



In a vehicle-sensitive inertia reel device of the pendulum type, the pendulum is arranged to cause a subsidiary pawl to

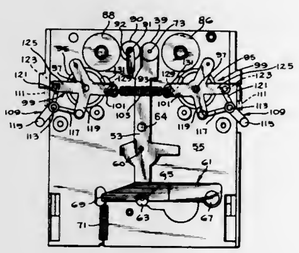
move from a first position in which it does not engage with a subsidiary ratchet wheel mounted on the reel to a second position in which it does so engage, rotation of the reel in the direction resisted by the main pawl when the subsidiary pawl is in its second position being operative to move the subsidiary pawl from its second position to a third position and movement of the subsidiary pawl from its second position to its third position being arranged to cause the main pawl to move from a first position in which it engages in one direction and a second position in which it does not so engage.

3,578,261
TAPE RECORDER OF MAGAZINE TYPE
Kozo Yamamoto, Hirakata-shi, and Toshio Kawada, Neyagawa-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd.,, Osaka, Japan
Filed Feb. 26, 1968, Ser. No. 708,312
Int. Cl. G11b *23/10*
U.S. Cl. 242—199 **16 Claims**



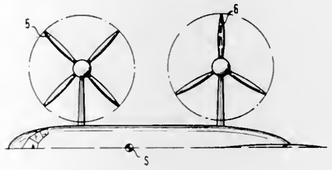
A tape recorder of the magazine type adapted to operate with a magazine of the kind in which a magnetic tape supplied from one reel is taken up on the other. In the tape recorder, the reel shafts and the capstan are mounted on a movable body which is pivotally and linearly movable in response to the insertion of the magazine into the recorder casing whereby the reel shafts and capstan are brought into driving engagement with the corresponding elements in the magazine.

3,578,262
CASSETTE CHANGER WITH FAST TAPE WIND
George C. Mandell, Des Plaines, Ill., assignor to Ampex Corporation
Filed Nov. 10, 1969, Ser. No. 875,208
Int. Cl. G03b *1/04*; **G11b** *15/32, 23/04*
U.S. Cl. 242—199 **7 Claims**



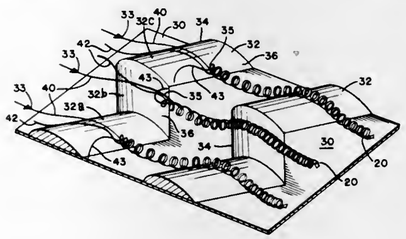
A cassette changer is provided with a tape drive system a portion of which is disabled, preferably whenever the cassette changer shifts to a pause position to space tape drive components and a sound transducer head from the tape, to permit the tape to be driven in either a forward or reverse direction at a speed faster than the operational speed.

3,578,263
VERTICALLY STARTING AND LANDING AIRPLANE
Siegfried Gunter, deceased late of Munich, Ruth Gunter, Executrix, Munich, Germany, assignors to Vereinigte Flugtechnische Werke Gesellschaft mit berschrankter Haftung fruher "Weser" Flugzeugbau/Focke-Wulf/Heinkel-Flugzeugbau, Bremen, Germany
Filed July 24, 1969, Ser. No. 870,207
Claims priority, application Germany, July 29, 1968, P 17 56 894.4
Int. Cl. B64c *27/28*
U.S. Cl. 244—7 **3 Claims**



A vertically starting and landing airplane with pivotable propellers in front and behind the center of gravity of the airplane, in which the propellers located in front of the center of gravity of the airplane have a greater number of blades than the propellers located behind the center of gravity of the airplane.

3,578,264
BOUNDARY LAYER CONTROL OF FLOW SEPARATION AND HEAT EXCHANGE
Arnold M. Kuethe, Ann Arbor, Mich., assignor to The Battelle Development Corporation, Columbus, Ohio
Filed July 9, 1968, Ser. No. 743,350
Int. Cl. B64c *21/10, 23/06*
U.S. Cl. 244—41 **23 Claims**

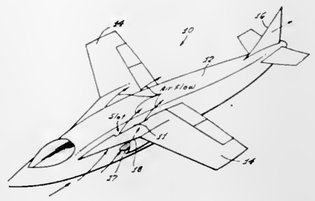


Boundary layer control for delay or prevention of flow separation and/or increase in rate of heat exchange between a surface and a fluid by an arrangement of surface elements which may take the form of either crests or discreet concave depressions in the surface, having effective depths or dimensions of less that of the adjacent boundary layer thickness, to cause the formation of vortices with succeeded surface elements being positioned to cause vortex amplification, for effective boundary layer mixing with less drag, weight penalty, noise, and energy loss than that of conventional vane-type generators.

3,578,265
AERODYNAMIC STRUCTURES
John W. Patierno, Hungington Beach; Vernon L. White, Los Angeles; Haig Asdurian, and Hans W. Grellmann, Torrance, Calif., assignors to Northrop Corporation, Beverly Hills, Calif.
Filed Oct. 6, 1969, Ser. No. 864,034
Int. Cl. B64c *3/00*
U.S. Cl. 244—42 **3 Claims**

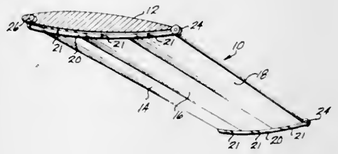
A jet-type aircraft the wings of which define slots or passageways passing through root portions of the wings and

opening on the upper and lower surfaces thereof functioning (1) to divert fuselage boundary layer air from side mounted inlets located below the wings and (2) to reduce adverse



fuselage boundary layer pressure gradients and prevent boundary layer thickening ahead of the engine inlets at high angles of attack or sideslip.

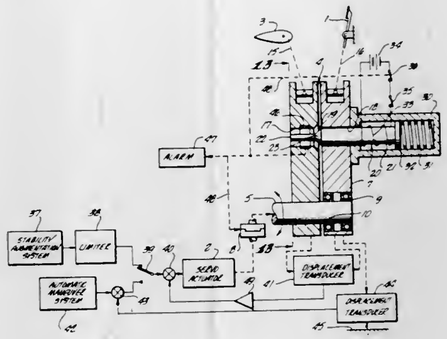
3,578,266
WING AREA ENLARGEMENT SYSTEM
Gerald G. Upton, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed June 16, 1969, Ser. No. 833,394
Int. Cl. B64c *3/50*
U.S. Cl. 244—43 **5 Claims**



An aircraft wing provided with at least one pivotally connected section which upon inversion enlarges the width of the wing surface. The section fits preferably against the under surface of the wing and is made of a plurality of segments, disposed somewhat like venetian blinds parallel to the length of the wing. Upon foldout the entire section will swing about a pivot point for approximately 180° while at all times the individual surfaces of the segments are maintained parallel to the main wing surface so that a minimum of air disturbance is experienced upon movement of the section.

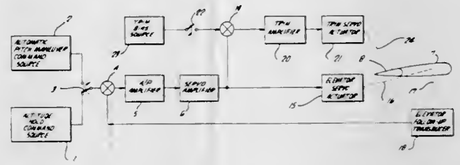
3,578,267
CONTROL SYSTEM WITH MULTIPLE FUNCTION CAPABILITY
Edward Kazmarek, Reseda, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Nov. 21, 1968, Ser. No. 777,798
Int. Cl. B64c *13/24*
U.S. Cl. 244—77 **22 Claims**

A first force-transmitting mechanism is adapted to move relative to a stationary frame responsive to a servoactuator. An element to be controlled is coupled to the first mechanism such that it moves with the first mechanism relative to the frame. A second force-transmitting mechanism is adapted to move relative to the frame in response to a manual input device. Mechanical coupling between the first and second mechanisms enables operation in one of two modes. In one mode, the mechanisms are coupled to move in a mutually independent manner relative to the frame within predetermined limits beyond which they move together. In addition to its normal function, the servoactuator operates responsive to a transducer that senses the displacement between the first and second mechanisms and returns the first mechanism to a null position relative to the second mechanism. In the other mode, the mechanisms are coupled



to move together relative to the frame without appreciable play.

3,578,268
AUTOMATIC PITCH CONTROL SYSTEM
Kenneth C. Kramer, Thousand Oaks, Calif., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Jan. 21, 1969, Ser. No. 792,366
Int. Cl. B64c *13/08*
U.S. Cl. 244—77 **3 Claims**

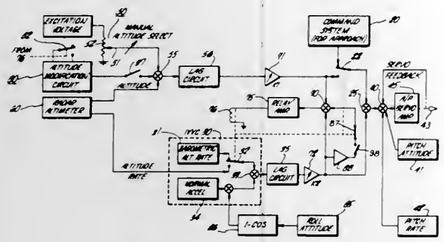


The elevator of an aircraft and a tab associated with the elevator are positioned by servoactuators both of which are driven by a common servoamplifier. In an automatic pitch-maneuver mode of operation, a constant pitchup trim bias signal is additively combined with the signal from the servoamplifier that drives the trim servoactuator. Prior to the execution of the pitch maneuver, the high-gain servoloop formed by the system overpowers the trim bias signal, thereby nullifying its effect. During the execution of the maneuver, the trim bias provides the added pitchup authority and a pitchup command in case of passive failure. The trim bias signal shifts the response of the aircraft to the pitch maneuver command so this response is unsymmetrical, having greater authority in the pitchup direction.

3,578,269
AUTOMATIC FLARE AND ALTITUDE HOLD SYSTEM
Kenneth C. Kramer, Thousand Oaks; Richard L. Davis, Pacific Palisades, and Otto H. Boe, Saugus, Calif., assignors to Lear Siegler, Inc., Santa Monica, Calif.
Continuation-in-part of application Ser. No. 631,972, Apr. 17, 1967, now abandoned. This application June 11, 1969, Ser. No. 839,766
Int. Cl. B64c *13/18*
U.S. Cl. 244—77 **27 Claims**

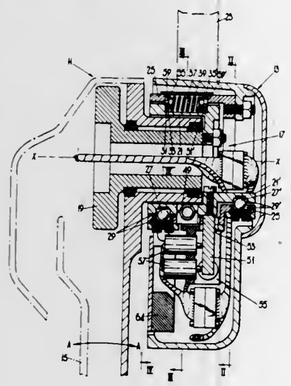
The invention disclosed by one representative embodiment herein includes an automatic pitch control system for an aircraft wherein a manual setting at any selected altitude produces a signal which is nulled out by a radar altimeter signal so as to automatically engage a pitch control flare circuit. Altitude error and altitude rate input signals are

summed for control of the pitch axis of the aircraft so that after flare is completed, an altitude over varying terrain is held. Steep bank angles at the altitude are possible without the aircraft leaving the altitude in that a roll attitude signal is



employed to oppose normal acceleration errors introduced by banking during coordinated turns. In addition, variable flare exponentials are described through the use of an altitude modification circuit.

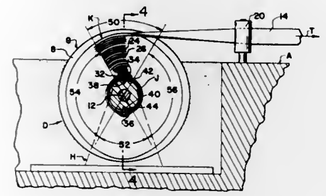
3,578,270
AIRCRAFT MANUAL CONTROL MEMBERS
Stafford Malcolm Ellis, Gravesend, England, assignor to Elliott Brothers (London) Limited, London, England
Filed Oct. 27, 1969, Ser. No. 869,552
Claims priority, application Great Britain, Oct. 25, 1968, 50,650/68
Int. Cl. B64c *13/04*
U.S. Cl. 244—83 **9 Claims**



A pilots manual control member for an aircraft is adapted to engage control runs of the aircraft so that, with the autopilot disengaged, pilot pitch and roll demands applied to the control member are transmitted by the control runs, either directly or by way of power amplification devices, to aircraft pitch and roll control surfaces. When the autopilot is engaged those control surfaces are normally automatically controlled via the control runs.

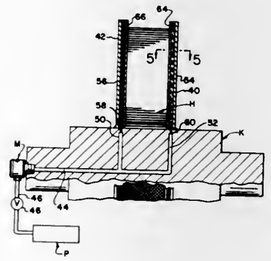
The control member is adapted so that, with the autopilot engaged, limited control of pitch and roll may be effected by the pilot by movement of the control member. Under these conditions the control member supplies electric demand signals to the autopilot.

3,578,271
AIRCRAFT ARRESTING DEVICE
Charles S. Thompson, Jr., Vincentown, N.J., assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.
Filed July 8, 1969, Ser. No. 839,870
Int. Cl. B64f *1/02*
U.S. Cl. 244—110 **7 Claims**



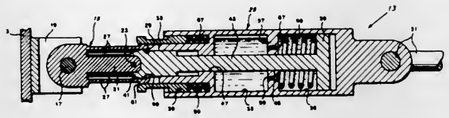
An aircraft arresting device includes a rotatable reel having a central axis and a hub on which an elongated flat tape is coiled in layer-by-layer convolutions. The hub has a noncircular cross-sectional shape and includes a plurality of radially extending projections. A tape coiled upon the hub of the reel is under greater compressive force in the area of the projections so that relative slippage between adjacent convolutions of the tape on the reel is prevented.

3,578,272
AIRCRAFT ARRESTING DEVICE
Charles S. Thompson, Jr., Vincentown, N.J., assignor to Gulf & Western Industrial Products Company, Grand Rapids, Mich.
Filed July 8, 1969, Ser. No. 839,989
Int. Cl. B64f *1/02*
U.S. Cl. 244—110 **12 Claims**



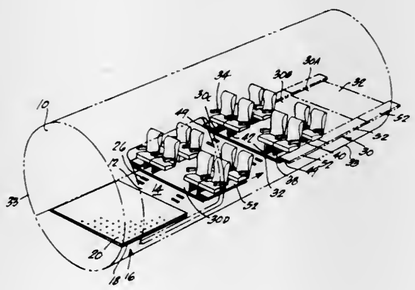
An aircraft arresting device includes a rotatable reel having an elongated flat tape coiled thereon in layer-by-layer convolutions. The tape has flat faces and side edges, and the reel has sideplates between which the tape is coiled on the reel hub. The side edges of the tape engage the sideplates of the reel to provide a frictional retarding force against slippage between adjacent layers of tape on the reel when the tape is placed under tension and uncoiled from the reel. The inner surfaces of the reel sideplates may be coated with a material having a high coefficient of friction to enhance the frictional retarding force acting against the side edges of the tape. The sideplates of the reel may be movable toward one another to vary the amount of force acting against the side edges of the tape.

3,578,273
REUSABLE HOLDBACK RELEASE DEVICE
Thomas P. Mulgrave, Glen Mills, Pa.
Filed Jan. 22, 1969, Ser. No. 793,125
Int. Cl. B64f *1/12*
U.S. Cl. 244—115 **7 Claims**



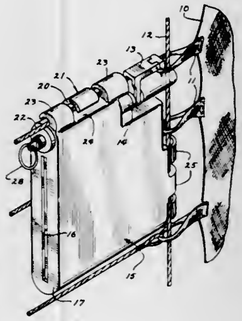
The present invention relates to novel and improved apparatus for restraining an aircraft from a catapult assisted takeoff until a predetermined required launch force is developed. The improved aircraft restraining or holdback apparatus includes a pair of coupling elements, one of which is secured to the aircraft and the other of which is secured to the aircraft takeoff surface. In their intercoupled condition, flexible fingers of the one element engage an annular groove in a piston operated component of the other element. A sleeve on the said other element normally prevents disengagement of the fingers from the groove until a preset axial load on the piston develops a pressure that permits movement of the piston to a position beyond the sleeve. When this occurs, the fingers of the one coupling element disengage themselves from the groove of the other coupling element, the holdback device is released and the aircraft begins its takeoff run.

3,578,274
PALLET ASSEMBLY
David L. Ginn, Garden Grove, and Donald A. Hilmer, Lakewood, Calif., assignors to McDonnell Douglas Corporation
Filed Oct. 31, 1968, Ser. No. 772,133
Int. Cl. B64c *1/18*
U.S. Cl. 244—118 **11 Claims**



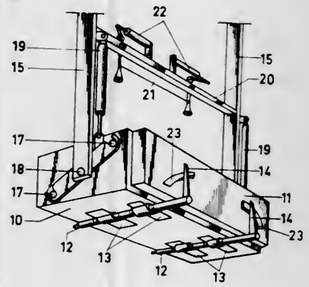
A pallet assembly of the type having movable side portions primarily useful in aircraft and other transportation devices. The pallet assembly includes a latching device whose structural components are secured respectively to the body of the pallet and the side cover thereof in a manner to provide an overcenter locking action when the latching device and side cover are moved from a stowed to a deployed position.

3,578,275
REEFING LINE CUTTER WITH ATTACHABLE TRIGGER ELEMENT
Marshall S. Kriesel, St. Paul; Lawrence Anderson, Fridley, and Paul E. Ericson, Minneapolis, Minn., assignors to Aerospace Systems Company, Minneapolis, Minn.
Filed Aug. 4, 1969, Ser. No. 847,170
Int. Cl. B64d *17/34*
U.S. Cl. 244—152 **5 Claims**



A device to positively position a triggering element for a reefing line cutter onto the parachute canopy an suspension lines so that the trigger element is at a predetermined orientation with respect to the ground during the drop to make the trigger element operation reliable.

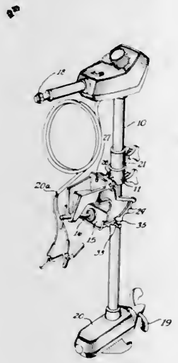
3,578,276
CELLULAR CONCRETE MOLD
Per-Erik Soderlund, Saltsjobaden, Sweden, assignor to Intong Aktiebolag, Hallabrottet, Sweden
Continuation of application Ser. No. 377,989, June 25, 1964, now abandoned. This application Nov. 10, 1966, Ser. No. 594,322
Int. Cl. B41b *11/60*
U.S. Cl. 249—165 **3 Claims**



An open-topped cellular concrete mold is formed with rigid sides and bottom, except for a detachable sidewall. Two shafts are rotatably mounted on the bottom of the mold, and have support members connected to their extended ends extending radially outwardly therefrom in the area of the detachable sidewall so as to move into engagement with and bear against the detachable sidewall to fasten it to the remainder of the unit when rotated into fastening position by the shafts. The other ends of the shafts are adapted to be grasped by turning members when the mold is moved into an orientation wherein the detachable sidewall is horizontally oriented, whereby the shafts can be rotated to release the detachable sidewall and the mold contents from the

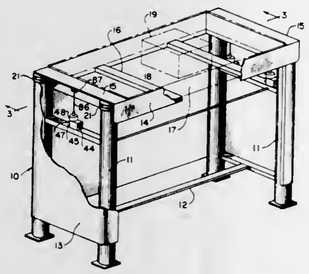
remainder of the mold. Wedge shaped members may be formed on the exterior surface of the detachable sidewall to cooperate with the supporting member in fastening the detachable sidewall tightly.

3,578,277
LOCKING ASSEMBLY FOR ELECTRIC OUTBOARD FISHING MOTORS
Ralph C. Osborn, Bloomington, Ill., assignor to Osborn Engineering Corporation
Filed Nov. 3, 1969, Ser. No. 873,186
Int. Cl. B63h *21/26*
U.S. Cl. 248—4 **4 Claims**



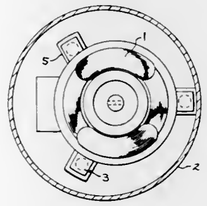
A locking assembly for electric outboard fishing motors with a manually actuated and spring-biased rod received within an aperture on the clamping cradle of the assembly when the propeller column supporting bracket and column are substantially horizontally disposed (a storage position) or disposed substantially perpendicularly to the clamping face of said cradle. The rod is part of an angular adjustment mechanism for the motor.

3,578,278
VIBRATION-ISOLATED SELF-LEVELING PLATFORM AND METHOD
Norman C. Pickering, Sag Harbor, N.Y., and Joseph P. Roberts, Arleta, Calif., assignors to ROBINTECH Incorporated
Filed June 16, 1969, Ser. No. 833,570
Int. Cl. A47b *9/02*
U.S. Cl. 248—20 **19 Claims**



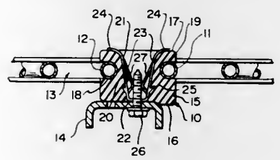
A pneumatically supported, load-carrying platform that is precisely controlled against minute excursions from a predetermined position while being cushioned against shock and vibration. The platform structure preferably is pendulously supported by a group of spaced pneumatically pressurized mounts or air springs, having individual sensors responsive to incipient deviations in the platform position and which control the pressure applied to the respective mounts so as to restore or maintain the platform within normal limits. Sensitivity of response, and adjustment of the system stability results from regulating the supply of air available to the mounts, and furnishing preestablished incremental pressures above the pressures needed for proper operation of the mounts, which incremental pressures are substantially independent of both the mount pressure and the pressure from the source of supply.

3,578,279
RESILIENT MOUNTING MEANS
Owen H. Scheldorf, Louisville, Ky., assignor to General Electric Company
Filed Sept. 10, 1969, Ser. No. 856,536
Int. Cl. F16f *15/00*
U.S. Cl. 248—20 **3 Claims**



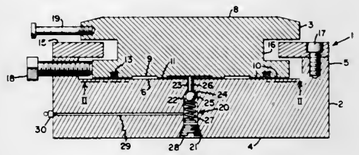
Resilient mounting means comprising an open coil, helical spring and a spring-anchoring means comprising a stud of a smaller diameter than the spring and having a tapered end. The stud has a circumferential groove thereon which is square with the axis of the stud and the end of the spring which is anchored on the stud has an end turn portion which is also square with the spring axis and of a reduced diameter so that when slipped over the tapered end of the stud and positioned within the groove, it grips the stud through an angle of more than 180° to form the sole means for anchoring the spring on the stud. From this anchoring portion, the spring spirals tangentially outwardly from the groove and thereafter, within the first complete turn of the spring, extends helically to clear the tip of the spring end turn.

3,578,280
TWIST TO MOUNT CONDENSER MOUNTING GROMMET FOR REFRIGERATOR
James P. Laughlin, and Everett Worman, Evansville, Ind., assignors to Whirlpool Corporation
Filed Oct. 13, 1969, Ser. No. 865,761
Int. Cl. F16l *3/08*
U.S. Cl. 248—54 **9 Claims**



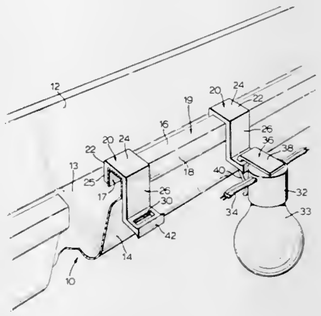
A vibration isolation mounting for the tubular coils of a refrigerator condenser having a resilient rubbery block for both mounting the condenser on a support structure and absorbing vibrations in the condenser so that these will not be significantly transferred to the support structure.

3,578,281
PRECISION ALIGNMENT FIXTURE
James C. Nielsen, Charleston, S.C., and John J. Turner, Amsterdam, N.Y., assignors to General Electric Company
Filed Feb. 13, 1970, Ser. No. 11,201
Int. Cl. F16m *13/00*
U.S. Cl. 248—346 **3 Claims**



A precision alignment fixture which has a base member and a floating disc between which is situated a pad of grease is described and may be utilized to align heavy workpieces to close tolerances. An O-ring is situated between the base member and floating disc in order to prevent leakage of the grease. The greasing system is of the type which utilizes a spring, ball, and pin together with a feedback arrangement for shutting off the flow of grease. Jack bolts are provided to instigate and control the horizontal aligning movements of the floating disc in any direction.

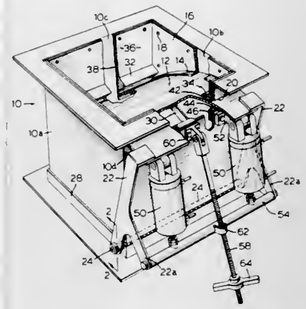
3,578,282
HANGER FOR OUTDOOR LIGHT SOCKETS
Carl J. Olsen, 1610 Belmont Ave., Ontario, Canada
Filed Oct. 1, 1969, Ser. No. 862,806
Int. Cl. E04b *7/18;* **F21v** *33/00*
U.S. Cl. 248—214 **5 Claims**



An integral hanger for attaching outdoor light sockets to eavestroughs. The hanger has a hooked upper portion for gripping the upper outer edge of an eavestrough, and an outwardly protruding portion at its lower end with an aperture for receiving the clip of an outdoor light socket.

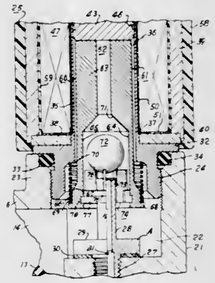
3,578,283
ARCUATE BLADE GATE VALVE
William H. Jones, Toronto, Ontario, Canada, assignor to Armstrong Jones Limited, Toronto, Ontario, Canada
Filed Apr. 24, 1969, Ser. No. 818,889
Int. Cl. F16k *1/20*
U.S. Cl. 251—31 **10 Claims**

A gate valve of the type commonly used to control the flow of pulverulent or granular material moving by gravity from hoppers and the like. The valve has an arcuate valve plate and the valve casing is formed with a deflector consisting of an integral inwardly projecting protuberance serving to prevent particles of the granular material from lodging



between the inner edge of the valve plate and the opposite wall which might prevent full closure of the valve.

3,578,284
SOLENOID VALVE
Leo A. Martini, Garland, Tex., assignor to Telsco Industries, Garland, Tex.
Filed Mar. 28, 1969, Ser. No. 811,303
Int. Cl. F16k *31/06*
U.S. Cl. 251—88 **5 Claims**

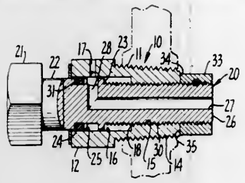


A solenoid valve useable as a pilot for actuating a flow control valve of the pressure responsive type, the solenoid valve having a coacting valve ball and seat and means upstream of and reciprocable axially of the valve seat for actuating the valve ball which includes a portion for holding said valve ball engaged with the valve seat, a portion spaced from the seated ball for unseating said ball and a valve cage portion in spaced surrounding relation to said valve ball. The valve ball actuating means has at least a portion of magnetic material adapted to function as an armature for a solenoid so as to be attracted thereby for unseating the valve ball, the solenoid including an electromagnetic coil having multifilar windings of fine gauge wire of the order of 0.004 of an inch whereby the coil is of reduced volume and increased efficiency and said solenoid is relatively minute.

3,578,285
SAMPLE AND BLEED VALVE
Sydney E. Carlton, 240 W. Hereford St., Gladstone, Oreg.
Filed June 26, 1969, Ser. No. 836,926
Int. Cl. F16k *31/50*
U.S. Cl. 251—218 **4 Claims**

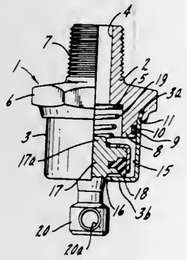
The bleed valve of the present invention has a fixed body member for installation through the wall of the particular pressure vessel involved so as to be in direct communication with the cavity. The main valve portion moves axially from the closed to the open position for bleeding or sampling and is restrained from going beyond the full open position. The

slidable portion is sealed against leakage of fluid pressure by an O-ring which has its own housing in the slidable portion and so remains in position at all times. It is always positioned beyond the fully open position so that no pressure or sample



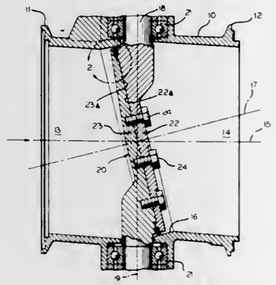
escapes beyond the intended outlet. The valve is useful for bleeding air or fluid under pressure in a pressure vessel, pump, or valve, particularly as a means for checking seals, sampling the contents, or reducing internal pressures.

3,578,286
DRAIN VALVE
Boleslaw Klimek, Des Plaines, Ill., assignor to Berg Mfg. & Sales Co., Des Plaines, Ill.
Filed Aug. 19, 1969, Ser. No. 851,205
Int. Cl. F16k *1/16;* **B21d** *53/10*
U.S. Cl. 251—303 **5 Claims**



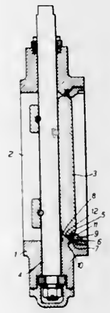
A fitting part has a flared slot in which is received the open end portion of a cup-shaped closure, the fitting and closure forming a chamber. A valve member is tiltable in an opening in the closure and yieldingly urged thereagainst. A seal is carried by the fitting part adjacent the flared slot.

3,578,287
BUTTERFLY VALVE
Paul G. Salerno, Glenview, and Steven J. Wilson, Chicago, Ill., assignors to Vapor Corporation, Chicago, Ill.
Filed Nov. 5, 1968, Ser. No. 773,458
Int. Cl. F16k *1/228*
U.S. Cl. 251—306 **5 Claims**



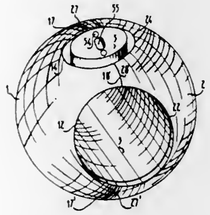
Butterfly valve for controlling fluid flow in conduits, and including a butterfly coacting with a seating bore in a casing having a peripherally mounted, solid sealing ring for engagement with a seating bore, wherein the sealing ring is mounted on the butterfly for radial movement to conform to the seating bore when the valve is closed.

3,578,288
BUTTERFLY VALVE WITH A SEALING RING HAVING A DOUBLE SWALLOWTAIL SHAPE IN CROSS SECTION
Erik Rishovd, Geithus, Modum, Norway, assignor to A/S Westad Armaturfabrik, Geithus, Modum, Norway
Filed Mar. 24, 1969, Ser. No. 809,570
Claims priority, application Norway, Mar. 29, 1968, 1211/68
Int. Cl. F16k *1/22*
U.S. Cl. 251—306 **4 Claims**



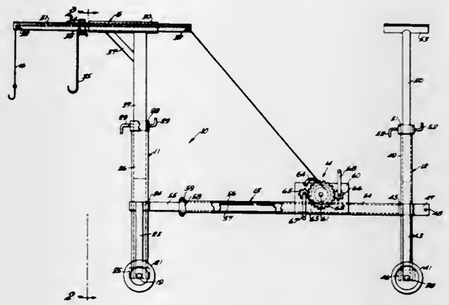
A butterfly valve comprising a valve housing and a rotatable disc-shaped valve body, sealing means between the valve body and the valve housing with a resilient sealing ring disposed in an undercut groove in the valve housing respectively the valve body and a sealing surface on the valve body respectively the valve housing, cooperating with said sealing ring, the cross-sectional configuration of the sealing ring and the undercut groove being as a substantially double swallowtail.

3,578,289
SPHERICAL VALVE PLUG
Max Thevignot, Chancenay, and Robert M. Schweblen, Saint-Dizier-Le-Neuf, France, assignors to Etablissements Thevignot
Filed Jan. 28, 1969, Ser. No. 794,595
Claims priority, application France, Jan. 18, 1968, 881
Int. Cl. F16k *5/06*
U.S. Cl. 251—309 **2 Claims**



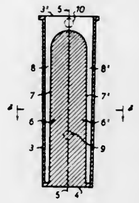
The invention relates to stopcocks with spherical plugs, used in ducts for conducting fluids and it concerns more particularly the spherical plugs themselves and their method of manufacture.

3,578,290
PORTABLE LOAD-HANDLING DEVICE WITH WINCH
Mohammed S. Gof, 89 Haledon Ave., Paterson, N.J.
Filed Feb. 18, 1969, Ser. No. 800,172
Int. Cl. B66c *23/60*
U.S. Cl. 254—139.1 **3 Claims**



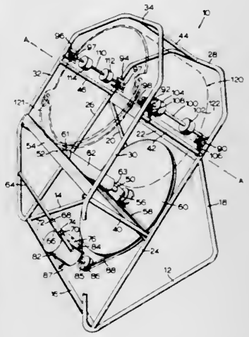
A portable, manually operated winch fabricated of welded-together steel tubing and channel members for economy of manufacture, and comprising wheeled, relatively adjustable and detachable front and rear frame assemblies, the front frame assembly of which has a relatively adjustable and detachable boom subassembly and the rear frame assembly of which has a relatively adjustably and detachable extension support member subassembly. A manually operated crank, ratchet wheel and drum mechanism is provided on the rear frame assembly for controlling a boom-lifting cable.

3,578,291
TEST TUBE HAVING INTEGRAL MIXING MEANS
Rudolf Oberli, Langenthal, Switzerland, assignor to Greiner Electronic AG,, Langenthal, Switzerland
Filed Sept. 26, 1969, Ser. No. 861,251
Claims priority, application Switzerland, Jan. 22, 1969, 876/69
Int. Cl. B01f *11/00*
U.S. Cl. 259—75 **7 Claims**



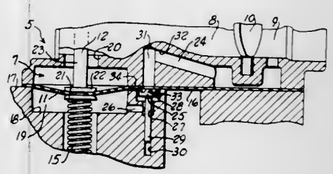
A test tube for mixing liquids, characterized by the provision of integral stirring means extending longitudinally from the bottom wall in spaced relation to the sidewall of the tube. The stirring means preferably is of knifelike configuration including a longitudinal edge adjacent and spaced from the internal surface of the sidewall whereby upon oscillation of the test tube about its longitudinal axis, a vortex is formed adjacent the edge to effect rapid thorough mixing. Preferably the test tube has a capacity of between about 0.5 and 5 milliliters and is designed for disposal after a single use.

3,578,292
PORTABLE MIXER
Aubrey V. Montague, 1190 Atwater Ave., Port Credit, Ontario, Canada
Filed Jan. 21, 1969, Ser. No. 792,393
Int. Cl. B01f *9/04*
U.S. Cl. 259—177 **8 Claims**



A lightweight and portable mixing machine having a two-stage speed reduction system wherein a cylindrical vessel is supported for rotation by a drive shaft for a one-stage speed reduction and said drive shaft is operatively connected to a prime mover by a pulley-belt arrangement for a second-stage speed reduction.

3,578,293
AUTOMATIC CHOKE ACTUATOR FOR SMALL ENGINES
John D. Santi, West Allis, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.
Filed Dec. 6, 1968, Ser. No. 781,940
Int. Cl. F02m *1/14*
U.S. Cl. 261—64 **4 Claims**

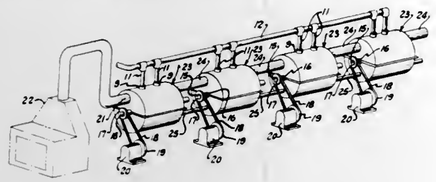


In an automatic choke actuator wherein the choke is spring-biased toward closed position and is opened by suction in a suction chamber acting on a pressure responsive actuator linked to the choke, the suction chamber is communicated with the fuel induction zone of the carburetor induction passage through a duct controlled by a pressure responsive throttling valve opened opened by suction in the induction passage and which closes to restrict flow of air back into the suction chamber.

3,578,294
SMOKE ELIMINATOR
Metody Chruniak, 27 Carlton St., Salem, Mass.
Filed June 19, 1969, Ser. No. 834,667
Int. Cl. B01f *3/04*
U.S. Cl. 261—90 **2 Claims**

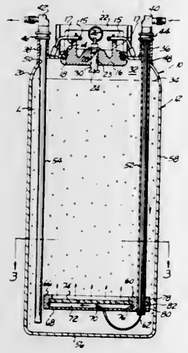
This invention consists of a horizontally disposed metal drum in the top of which water is piped under pressure through one or more nozzles. A horizontally disposed paddle wheel is located within the drum which is provided with end plates. The paddle wheel is rotated by an electric motor as smoke, from any desired type of burner or furnace, is piped horizontally into one end of the drum where the smoke dis-

appears on mixing with the churned water. Two or more of the aforesaid drums can be connected end to end depending on the amount of smoke to be eliminated. The paddle wheel of each drum is driven by a separate electric motor, while the



smoke from the first drum will be fed on into the second drum and so on until all of the smoke disappears. The water is drained from the opposite and lower end of each drum from which the smoke enters the drum.

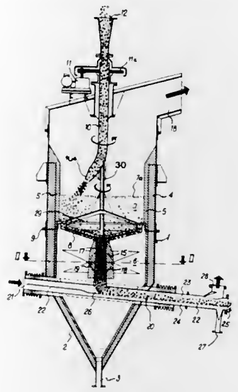
3,578,295
SELF-CONTAINED ABSORPTION GAS CHARGER FOR LIQUIDS
James L. Hudson, 5950 Yorkshire Road, Detroit, Mich.
Filed July 29, 1969, Ser. No. 845,749
Int. Cl. B01f *3/04*
U.S. Cl. 261—122 **7 Claims**



A pressuretight receptacle contains the water or other liquid to be saturated with gas, such as carbon dioxide gas supplied to it from a conventional carbon dioxide cylinder, through an elongated capillary tube leading to a porous sintered powdered metal diffuser which creates a myriad of small bubbles of the gas which, passing upward through the liquid, saturates the liquid with gas. The elongated capillary tube retards the flow of gas to the diffuser and thereby prevents the gas bubbles from being discharged therefrom too rapidly for the liquid to absorb them. The surplus gas not absorbed by the liquid collects in the top space above the liquid level and serves as a pressurized chamber to dispense the carbonated liquid through a dispensing pipe leading to the bottom of the receptacle. The diffuser is supported by a pipe through which the capillary tube extends and is protected thereby.

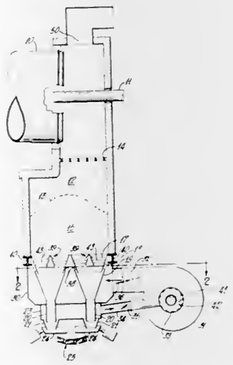
3,578,296
APPARATUS FOR TREATING PARTICULATE MATERIALS
Michel Boucraut, Metz; Imre Toth, Longeville les Metz, and Jean Pierre Reyter, Maizieres les Metz, France, assignors to Institut De Recherches De La Siderurgie Francaise, St. Germain-en-Laye, Yvelines, France
Filed June 27, 1969, Ser. No. 837,101
Claims priority, application France, July 10, 1968, 158562
Int. Cl. F27b *15/08*
U.S. Cl. 263—21A **10 Claims**

Apparatus for drying particulate materials having particles of different sizes comprises an upright vessel provided with a grate whose upper surface slopes toward a central opening and receives material from a rotary distributor. Products of combustion are fed into the vessel below the grate so that the ascending gas fluidizes the material above the grate. The material travels toward and into the opening of the grate and



is evacuated by way of a central conduit to enter an adjustable pneumatic conveyor which classifies treated material according to size. A revolving scraper is employed to prevent clogging of the grate and/or caking of material along its upper surface.

3,578,297
APPARATUS FOR COOLING PARTICLES
Lee H. Niems, 2702 Brassie, Flossmoor, Ill.
Filed June 23, 1969, Ser. No. 835,696
Int. Cl. F27b *7/02*
U.S. Cl. 263—32 **16 Claims**

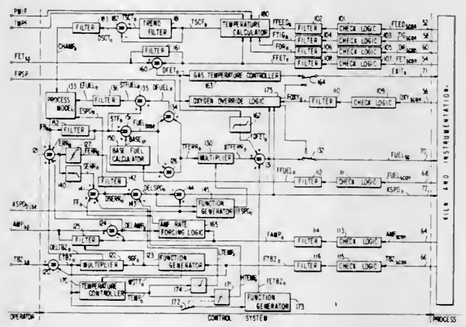


Apparatus for cooling heated pieces of matter and particularly calcined lime pebbles or particles, wherein cool air is injected under positive pressure into the path of and counter to the downwardly moving mass of pebbles with a coincident partial downward flow of air which is automatically balanced and prevented from blowing free particles of dust from the mass into the surrounding atmosphere by sucking the downward flowing air and coincident dust particles into a negative pressure recirculating path also generated by the positive pressure means.

This invention is directed to a method and apparatus for air cooling high temperature masses of particles continuously discharged from pyroprocessing apparatus here exemplified by calcined lime pebbles such as are produced from a limestone calcining operation in a kiln. The invention is not limited to cooling of lime pebbles alone, however, since it

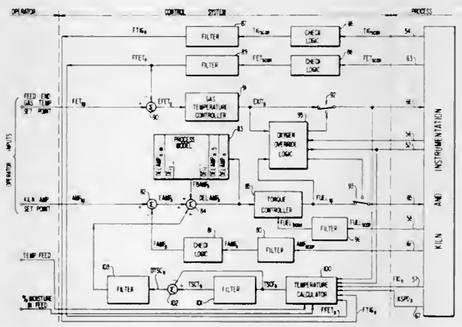
may be applied to cooling other heated pieces of matter such as deadburned dolomite, cement, expanded shale and the like. The term particles are used herein refers to the many forms of such materials including large and small pieces, pebbles, granules, broke solids, fragments, clinkers etc. In this regard, lime particles cooled in the apparatus herein described may, for example, range in size from dust less than 60 mesh to 1 inch to 2 1/2 inch pebbles or larger.

3,578,298
METHOD AND APPARATUS FOR CEMENT KILN CONTROL
Myron Robert Hurlbut, Peabody, Mass.; Robert Arthur Phillips, and Leland Chester Tupper, Schenectady, N.Y., assignors to General Electric Company
Filed Sept. 26, 1969, Ser. No. 861,424
Int. Cl. F27b *7/20*
U.S. Cl. 263—32 **19 Claims**



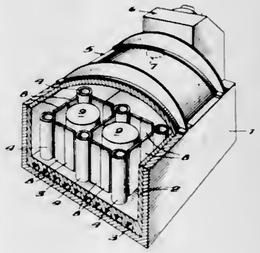
A rotary cement kiln control system and method. Burning zone temperature and torque measurements generate a total process error apportioned to fuel and speed control for the kiln. The control system responds to short-term process disturbances to maintain thermal stability in the kiln and the contributions of the burning zone temperature and torque measurements are modified in accordance with thermal stability. Feedback representing expected variations in the measurements is provided. Unusual or adverse conditions are sensed to generate override signals. The effect of torque in the chain section of the wet kiln is also considered in control.

3,578,299
METHOD AND APPARATUS FOR CEMENT KILN CONTROL
Myron R. Hurlbut, Peabody, Mass., assignor to General Electric Company
Filed Sept. 26, 1969, Ser. No. 861,425
Int. Cl. F27b *7/20*
U.S. Cl. 263—32 **10 Claims**



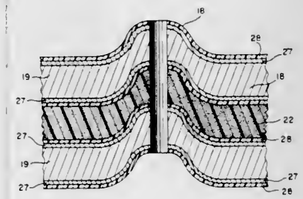
A method and apparatus for controlling the operation of a rotary cement kiln which is fed with an incoming slurry. The fuel rate set point and the exit gas rate set point are controlled. The control of fuel rate set point is based upon kiln drive motor torque measurements in conjunction with feedback signals generated by a dynamic kiln model which stores a record of past control actions and a calculated effect of the slurry drying characteristics in the kiln. Control of the exit gas rate set point is based upon measurements of gas temperature at the feed end of the kiln. Oxygen content of the exit gas is monitored and employed to exercise overriding control to insure that no combustibles which might cause an explosion appear in the exit gas.

3,578,300
BAKING FURNACE
Allen C. Goodrich, East Aurora, N.Y., assignor to The Carborundum Company, Niagara Falls, N.Y.
Filed Dec. 20, 1968, Ser. No. 785,519
Int. Cl. F27b *5/00*
U.S. Cl. 263—41 **7 Claims**



A baking furnace for carbonaceous bodies, such as electrodes for the steel industry, having metal flues extending therethrough for conveying the baking heat to the baking media that surrounds the bodies. Inserts of heat conductive material are strategically placed in the media so as to facilitate the distribution of heat from the flues to the area of the bodies and to obtain a uniformity of baking temperature therearound.

3,578,301
FURNACE SUPPORT FOR RESINOID PREFORMS
Gardner E. Alden, Fayville, and George M. Herterick, Westboro, Mass., assignors to Avco Corporation, Cincinnati, Ohio
Filed Nov. 6, 1969, Ser. No. 874,610
Int. Cl. F27b *21/00*
U.S. Cl. 263—47 **9 Claims**

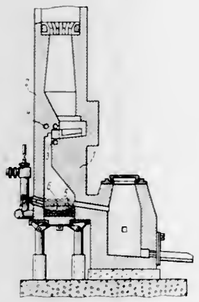


The invention relates to a support used in combination with a resinoid preform for maintaining the shape of the preform as it is cured in a furnace. More particularly, the invention relates to a furnace batt used to support a preform of a resinoid grinding wheel while the wheel is cured in a furnace at elevated temperature, usually over prolonged period of times. Broadly, the invention comprises a substrate which conforms very closely to the shape of the preform. The top and bottom surface of the substrate is coated with a hard metal coating. Preferably the exposed surface of the coating has a textured or roughened surface. The hard metal coating is, in turn, covered with a fluorocarbon composition. In the preferred embodiment an aluminum substrate is coated with molybdenum, the latter having a textured surface. A fluorocarbon coating is applied over the molybdenum.

3,578,302
GAS CUPOLA FURNACE WITH A SPECIAL SUPERHEAT HEARTH

Anatoly Alexeevich Cherney, ulitsa Tsiolkovskogo, 41, kv.; Vladimir Alexandrovich Grachev, ulitsa Uritslogo, 74, kv. 9, Penza; Lev Mikhailovich Marienbakh, ulitsa Bolshaya Cherkizovskaya, Korpus, 1, kv. 73, Moscow; Ivan Lukich Kurbatsky, ulitsa Volodarskogo, 70, kv. 4; Efim Davidovich Sosnovsky, ulitsa Sbornaya, 7, kv. 35, and Nikolai Semenovich Pavlenko, ulitsa Dokuchaeva, 1, kv. 18, Penza, U.S.S.R.

Filed May 15, 1967, Ser. No. 638,204
Claims priority, application U.S.S.R., June 27, 1966, 1088005
Int. Cl. C22b *9/12*
U.S. Cl. 266—11 **8 Claims**

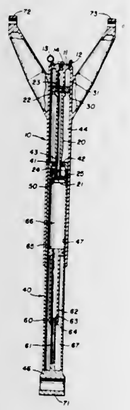


A gas cupola furnace for making metals, said furnace having a hearth comprising various chemical reagents which contact the molten metals for the purpose of changing the chemical composition thereof.

3,578,303
OLEO-PNEUMATIC SHOCK ABSORBERS

John P. Fullam, Baie O'Urfe, Quebec, Canada, assignor to Abex Industries of Canada Ltd., Montreal, Quebec, Canada

Filed Apr. 2, 1969, Ser. No. 812,652
Int. Cl. F16f *5/00*
U.S. Cl. 267—64 **8 Claims**

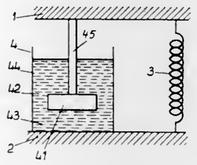


A two-stage oleo-pneumatic shock absorber incorporating an overload relief valve for instantaneous damping of transient loads. A cylindrical oil chamber is separated by a movable orifice plate into high- and low-pressure stages which are connected by a hollow metering pin passing through the orifice. The relief valve comprises a high-pressure air chamber separated from the oil in the high-pressure stage by an annular floating piston which encircles and normally covers large holes in the metering pin. When a transient load increases the oil pressure in the shock absorber, the floating piston moves, compresses the air, uncovers the holes and "dumps" high-pressure oil down the hollow metering pin to the low-pressure side of the orifice plate.

3,578,304
APPARATUS FOR DAMPING OSCILLATIONS

Wolfgang Hasselbach, Konigstein, and Heinz Heim, Egelsbach, Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Main, Germany

Filed Dec. 10, 1968, Ser. No. 782,530
Claims priority, application Germany, Dec. 14, 1967, P 15 72 419.3
Int. Cl. F16f *5/00*
U.S. Cl. 267—121 **9 Claims**

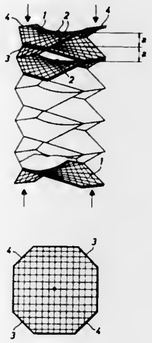


A shock absorber for electroacoustical instruments such as record players also suppresses oscillations in the audible frequency range which interfere with the quality of the reproduced sound. The dual function of the shock absorber is carried out by a combination of dampers in a system providing three-dimensional freedom of motion. The shock absorber thus is an acoustic filter for periodic and aperiodic oscillations with varying amplitude-frequency characteristics.

3,578,305
SPRING

Otto Muelhauser, Berghausen, Germany, assignor to Gesellschaft Fur Kernforschung G.m.b.H.

Filed Aug. 28, 1968, Ser. No. 764,366
Int. Cl. F16f *1/34*
U.S. Cl. 267—165 **5 Claims**

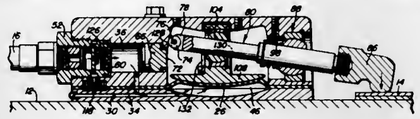


A novel spring composed of a multiplicity of doubly arcuate plates (preferably hyperbolic parabaloids) which are attached together into a stack. The particular attachment means is for next adjacent plates to be attached to each other along a pair of opposite edges with each plate being attached to the plate before it and the plate after it by alternating opposite edge pairs (preferably 90° apart).

3,578,306
AIR PRESSURE OPERATED CLAMP

Kenneth C. Smith, 35 Harbord Drive, Bloomington, Ill.

Filed June 5, 1969, Ser. No. 830,704
Int. Cl. B23q *3/08*
U.S. Cl. 269—24 **14 Claims**

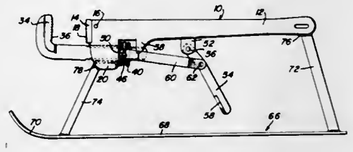


A workpiece is clamped to a supporting surface by slidable extension and pivotable displacement of a lever element relative to a mounting body. An air operated piston extends the lever element from the body against the bias of a retraction spring. When the piston reaches a limit position, the lever element is automatically pivoted under a larger clamping force transversely of the piston to clamp the workpiece at its outer engaging end.

3,578,307
PIPE WRENCH CONSTRUCTION

Coy B. Lock, Alice, Tex., assignor to Clemens N. Freybig, Alice and Paul Racusin, Corpus Christi, Tex., a fractional part interest to each

Filed May 6, 1969, Ser. No. 822,139
Int. Cl. B34q *3/02*; **B25b** *13/16*
U.S. Cl. 269—96 **8 Claims**

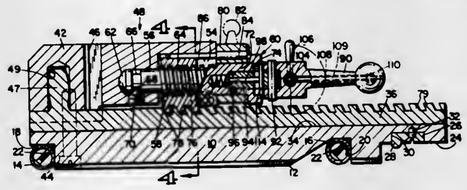


A wrench construction including an elongated handle having an endwise facing stationary jaw at one end and defining a short sleeve disposed to one side of the stationary jaw. An elongated threaded shank is slidably received through the sleeve and includes a second laterally outwardly projecting movable jaw facing toward, opposing and aligned with the stationary jaw. A thrust nut is threaded on the shank and opposes the sleeve end remote from the movable jaw. Further, an overcenter lever assembly is connected between the handle and the nut for shifting the shank relative to the handle.

3,578,308
VISE

John Jesionowski, 1437 Chrysler Ave., Schenectady, N.Y.

Filed May 27, 1968, Ser. No. 732,313
Int. Cl. B25b *1/12*
U.S. Cl. 269—212 **1 Claim**

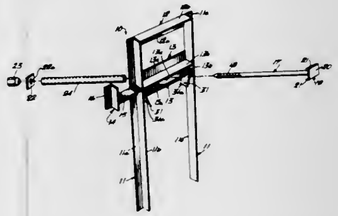


A quick-acting precision vise including a movable jaw movable rectilinearly toward and away from a stationary or immovable jaw along an anchored vise rack or power bar whereby the jaws may be first manually and quickly brought into contact with two opposite sides of a workpiece, and may be secondly forced into accurate tight locked gripping contact therewith by application of the power of a comparatively fine screw and without causing stress or distortion of the workpiece or of the workholder.

3,578,309
MULTIPURPOSE CONCRETE FORM CLAMP

Albert Freedman, 7451 N.W. 63rd St., Miami, Fla.

Filed Aug. 4, 1969, Ser. No. 847,120
Int. Cl. E04g *17/06, 13/02*
U.S. Cl. 269—287 **4 Claims**

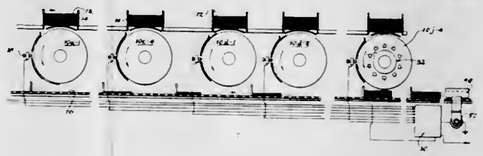


A multipurpose form clamp for use in forming concrete beams and columns is described. Each clamp is fabricated of a pair of angle-iron leg members held in spaced relation by an end angle-iron member at one end and a pair of intermediate, mutually spaced transverse angle-iron members defining therebetween an opening for the reception of an interconnecting bolt for securing a pair of clamps against the outsides of spaced, parallel column forms. The clamps are also usable as beam-forming clamps by straddling the open ends of their leg members over the upper ends of beam form boards. Each clamp is provided with a right-angular bracket member projecting from one side, which serves as a locating slot for the reception of continuous wales upon use of the clamps in beam forming, and which provide means for hookingly interengaging the clamps when used for the support of corner column form boards.

3,578,310
SIGNATURE OR SHEET COLLATING SYSTEM

Joseph R. Carson, Jr., Lancaster, N.Y., assignor to J. W. Clement Company, Depew, N.Y.

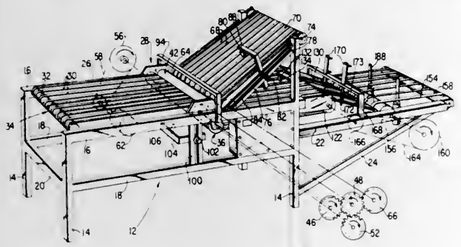
Filed June 25, 1969, Ser. No. 836,453
Int. Cl. B65h *39/02*
U.S. Cl. 270—54 **10 Claims**



In a signature or sheet collating system having N groups of feeders delivering signatures out of phase one to another onto a collating conveyor and calipering devices serving to detect a malfunction in the delivery of signatures by the feeders, the improvement comprising an electrical monitoring device including a shift register adapted to receive signals from the calipering devices in accordance with the position at which a malfunction occurs along the conveyor and being effective to reject a book rendered imperfect by a malfunction at a station beyond the last feeder, the shift register being formed of N banks of functional elements driven in synchronization one with each group of feeders. The N banks are serially interconnected by spacer functional elements permitting delay in driving of a succeeding bank, so as to per-

mit spacing between adjacent groups of feeders to exceed the spacing between individual feeders forming such groups.

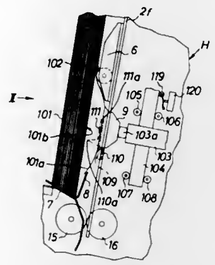
3,578,311
FOLDING METHOD AND APPARATUS THEREFOR
Philip W. Wood, Larchmont, N.Y.; Terry L. Carter, Jr., and Terry L. Carter, III, Sparta, N.J., assignors to Cities Service Company
Filed May 29, 1969, Ser. No. 828,828
Int. Cl. B65h *45/14*
U.S. Cl. 270—69 **7 Claims**



A method and apparatus for forming multitransverse folds in limp sheets, preferably polyethylene bags, is disclosed. The method consists essentially of placing the sheet intermediate its ends opposite a pair of adjacent counterrotating rolls having their adjacent surfaces moving away from the sheet, and tucking the sheet into the rolls by applying jets of high velocity air against the sheet in the area opposite the rolls. The pair of rolls draw the sheet between themselves, folding it over itself at the point the sheet enters the space between the rolls. Similarly, a second transverse fold is made by positioning the folded sheet intermediate its folded and unfolded ends opposite a second pair of counterrotating rolls having adjacent surfaces moving away from the sheet, tucking the folded sheet into the second pair of rolls by applying jets of high velocity air against the sheet and drawing the sheet into the second pair of rolls, folding it over itself a second time. The twice-folded sheets are then counted and a predetermined number of sheets are stacked on top of each other before being removed. A machine for accomplishing the method of this invention comprises a frame a first nip roll mounted horizontally on the frame, a second nip roll mounted adjacent the first roll, a third nip roll mounted directly below the second nip roll, all three nip rolls being driven counterrotationally to each other by a motor and suitable gears. A first set of air nozzles are positioned on the frame above the space between the first and second nip rolls and is supplied with air in response to the presence of a sheet in position on the nip rolls. Similarly, a second set of air nozzles are mounted on the frame and directed towards the juxtaposed second ad third nip rolls, and are supplied with air in response to the presence of the fold sheet opposite the rolls. Additionally a counter, program timer, counting conveyor, pivoted elevator and holding conveyor are mounted on the frame to count and stack the folded sheets.

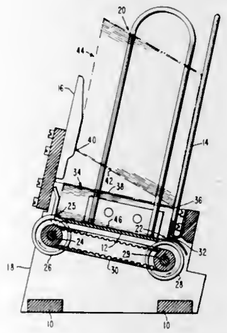
3,578,312
SHEET FEEDING APPARATUS
Franz Kocourek, Munich, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Apr. 1, 1969, Ser. No. 811,741
Claims priority, application Germany, Apr. 4, 1968, P 17 72 141.4
Int. Cl. B65h *3/08*
U.S. Cl. 271—20 **7 Claims**

The foremost sheet of a pile of smooth-surfaced sheets abuts against a roller with its upper portion, and is located behind an upwardly extending stop with its lower edge prior to separation from the next following sheet. Such separation is brought about by a suction head which moves a portion of the foremost sheet away from the next-following sheet so that the foremost sheet is flexed between the roller and the stop and permits air to penetrate between its rear surface and the



front surface of tee next-following sheet. After a predetermined period of dwell in a position corresponding to maximum flexing of tee foremost sheet, the suction head causes the lower edge of the foremost sheet to clear the stop and to move downwardly into the range of driven advancing rolls.

3,578,313
RECORD CARD HOPPER LOAD-REDUCING DEVICE
Rolf H. Eppinger, Detroit, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Filed Feb. 24, 1969, Ser. No. 801,553
Int. Cl. B65h *3/42*
U.S. Cl. 271—41 **3 Claims**

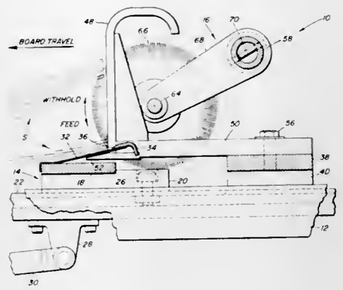


The disclosure embodies a card stack hopper, a card feeder to feed cards singly from the bottom of the stack, and a card baffle which precludes the descent of cards from an upper portion of the stack to a lower portion of the stack until the height of the latter is decreased to a predetermined level.

3,578,314
BRUSH FEEDER FOR WARPED SHEETS
Henry D. Ward, Jr., Phoenix, Md., assignor to The Ward-Turner Machinery Company, Baltimore, Md.
Filed Nov. 25, 1968, Ser. No. 778,629
Int. Cl. B65h *1/06, 5/16*
U.S. Cl. 271—44 **21 Claims**

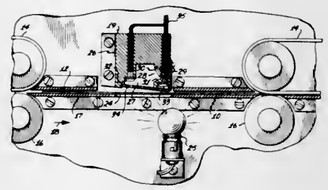
This invention pertains generally to sheet feeding apparatus wherein a bottom feeder is provided for bottom feeding of sheets from a stack in a hopper. The hopper is provided with sheet retaining and aligning vertical means. A reciprocating feeder bar with spring clips works beneath the hopper. A revolving friction brush positioned to wipe against

the trailing edges of the stack of sheets continuously brushes them down against force of the spring clips and presents the



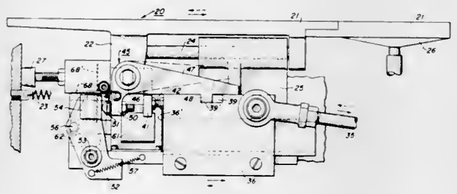
lowermost sheet for engagement by an extractor ledge as it rests upon an extended ledge of lips.

3,578,315
OVERLAPPED DOCUMENT DETECTOR
Richard E. Milford, Phoenix, Ariz., assignor to Honeywell Information Systems Inc.
Filed Oct. 4, 1968, Ser. No. 765,062
Int. Cl. B65h *7/12*
U.S. Cl. 271—47 **10 Claims**



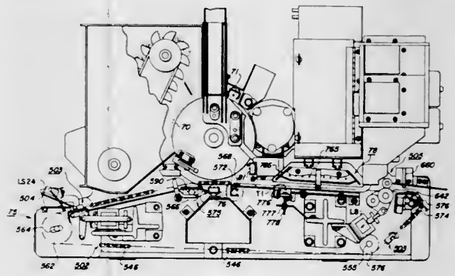
A document handling system is disclosed in which the documents are serially-fed along a predetermined path. The system further includes a sensor apparatus to detect any overlapped feeding of the documents.

3,578,316
DRIVING APPARATUS FOR ARTICLE FEEDERS
Donald W. Watson, Arlington Heights, and Herbert C. Artelt, Jr., Wildwood, Ill., assignors to Xerox Corporation, Rochester, N.Y.
Filed Nov. 12, 1968, Ser. No. 774,956
Int. Cl. B65h *7/18*
U.S. Cl. 271—54 **5 Claims**



A driving apparatus for shuttle type article feeders, the apparatus including a latch mechanism adapted to couple the shuttle with a reciprocating driving element, abutment means selectively interposed in the path of movement of the latch mechanism and contactable with an operating arm of the latch mechanism to cause release of the latch mechanism and uncoupling of the shuttle, means to restrain the shuttle against movement when uncoupled, and control means limiting uncoupling of the shuttle to a predetermined shuttle operating position.

3,578,317
SHEET CONVEYOR APPARATUS FOR AUTOMATIC COPYING MACHINE
Edward H. Burnham, and Edward J. Lavander, Rochester, N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed May 14, 1969, Ser. No. 824,543
Int. Cl. B65h *29/68*
U.S. Cl. 271—69 **6 Claims**



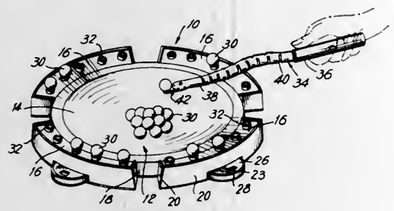
Sheet conveyor apparatus for conveying cut sheets through an automatic copying machine. Gripper devices grip the leading edge of sheet material supplied at a sheet feed-in station and drive apparatus move said gripper devices through a predetermined path including an image transfer station at which a developed image is transferred onto said sheet material and an image fusing station at which said image is permanently affixed to said sheet material while said sheet material is maintained in a substantially planar position. Camming devices release the gripper devices from the sheet material at a sheet feed-out station and sheet feed-out apparatus positioned at the sheet feed-out station and operatively connected to said drive apparatus receive the movement of said sheet material along the predetermined path. A control circuit emits electrical signals for controlling the operation of said gripper devices and sheet feed-out apparatus to enable sheet material to be continuously conveyed through the aforementioned stations.

3,578,318
PNEUMATIC AMUSEMENT AND EDUCATIONAL DEVICE
James V. Young, Clayton, Mo., assignor to Monsanto company, St. Louis, Mo.
Filed Feb. 20, 1969, Ser. No. 800,953
Int. Cl. A63g *31/00*
U.S. Cl. 272—1R **17 Claims**

A pneumatic amusement and educational device consisting of at least two bellows structures and an interconnecting hose

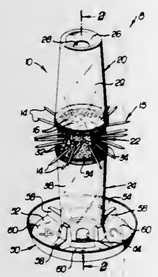
which affords an action similar to a seesaw for two or more riders.

3,578,319
MARBLE PICKUP GAME WITH FLEXIBLE MANIPULATOR
Frank Kohner, New York, N.Y.; Albert Stubbman, Franklin Lakes, N.J., and Natalie Donna, New York, N.Y., assignors to Kohner Bros., Inc., East Paterson, N.J.
Filed Dec. 20, 1968, Ser. No. 785,471
Int. Cl. A63f *9/00*
U.S. Cl. 273—1(R) **11 Claims**



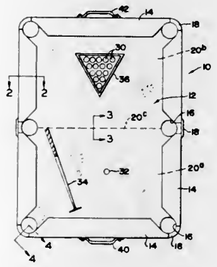
A dish-shaped concave base is provided with a plurality of open-ended upright tubular goal seats adjacent the outer periphery thereof. Several marbles are placed within the base and a manipulator is employed to carry a single marble from the central portion of the base to a seated position on the open end of one of the tubular goal seats. The manipulator is an elongated member having a handle at one end and at the other end, a pickup member with a cut out portion suitable for sliding under the major spherical diameter of a marble resting on the base and lifting the marble. Intermediate its ends, the manipulator is formed of a plurality of segments joined by hinges, the pivotal axes of which are all parallel. The hinges permit movement of the segments with respect to one another while maintaining all of the moving segments within the same plane transverse to the pivotal hinge axes and ideally horizontal when the game is being played. A player lifts one of the marbles from the base by the pickup member in the front of the manipulator and places the marble over and onto one of the tubular goal seats to score a point in the game.

3,578,320
GAME STRUCTURE AND METHOD
Adolph E. Goldfarb, 7427 Varna St., and Rene Soriano, Los Angeles, Calif.
Filed Feb. 19, 1968, Ser. No. 706,439
Int. Cl. A63f *7/02*
U.S. Cl. 273—1 **10 Claims**



A game comprising a hollow upright transparent conduit having a plurality of apertures in an intermediate section to releasably receive and support a plurality of rods which form a variable interdependent network barrier across the conduit. The rods support a plurality of discrete objects such as marbles, and the players of the game remove the rods one at a time, with each endeavoring to remove a rod in accordance with a game objective such as not permitting any marbles to fall through the barrier. The objects are of such a size with respect to the conduit that at least two rods are necessary to prevent passage of the objects. A method of playing a game comprising positioning a plurality of rods to form a network barrier across a flow path; positioning a plurality of objects upstream of the flow path above the barrier; and selectively removing the rods successively to control the passage of objects past the barrier.

3,578,321
PUTTER-POOL GAME DEVICE
Charles M. Skully, 10 N. Main St., Akron, Ohio, and Richard W. LaConte, 320 S. O. M. Road, Cleveland, Ohio
Filed Apr. 15, 1968, Ser. No. 721,456
Int. Cl. A63g *31/00*
U.S. Cl. 273—2 **6 Claims**

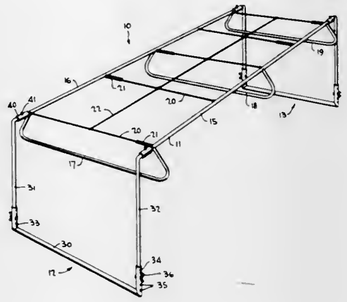


A game device which is a portable package having a smooth carpeted playing surface and edges to define a pool table configuration, with pockets and bumpers, where the package unfolds to lay flat on the floor to stretch the carpet tight because of the abutment of the carrying base when the device is unfolded. Golf balls are utilized as the balls and putted with a putter to achieve the combination of putting with pool. The device is portable and can be folded to store all the balls and clubs inside between the carpeted surfaces in the folded condition. A carrying handle also serves to retain the device in the folded condition.

3,578,322
RAMP STRUCTURE
John T. Kerr, 1343 W. 42nd St., Baltimore, Md.
Filed Oct. 13, 1969, Ser. No. 865,640
Int. Cl. A63d *5/00*
U.S. Cl. 273—54R **6 Claims**

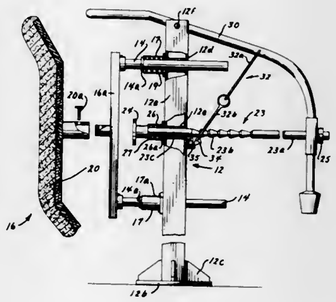
A ramp structure is provided. It consists of a lap board for a sitting player and parallel rails for launching a rolling ball. The flat undersurface of the lap board rests on the thighs of the sitting player. Spaced apertures on the board are provided for storage of bowling balls.

3,578,323
PORTABLE RUNNING CHUTE
James T. Coleman, and James W. Fox, Paducah, Ky., assignors to Coleman-Fox, Inc., Paducah, Ky.
Filed June 27, 1968, Ser. No. 740,558
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 **9 Claims**



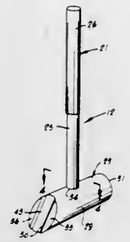
A training device for runners is provided wherein an elongated framework is positioned above the ground at a height lower than the normal height of the runner so that an extended overhead obstruction is provided. The framework includes crossmembers at spaced intervals and a plurality of resilient crosslines at spaced intervals different from said crossmembers with the latter being at a lower position so that a multilevel obstruction is provided to simulate spaced obstacles along the chute. The framework is supported by upright U-shaped stands at each end of the chute that also serve as indicating devices as to the relative position of the overhead obstruction. Further, adjusting means is provided to allow varying the height of the framework for different exercises and different height runners.

3,578,324
FOOTBALL BLOCKING APPARATUS
George H. Alvey, 2805 N. Garvin St.; Paul E. McDaniels, 1100 N. Kelsey Ave., Ind., and Roy T. Pease, Jr., 3301 Cave Ave., Evansville, Ind.
Filed Dec. 2, 1968, Ser. No. 780,473
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 **1 Claim**



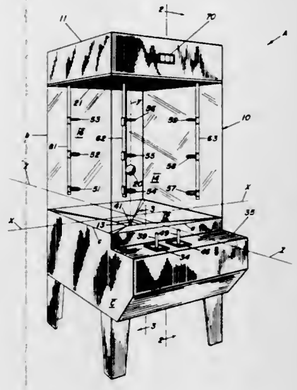
An athletic practice apparatus having particular adaptability for the game of football characterized by the movement of a blocking structure from a first position to a second position by reason of body contact, and when at such second position, a thrust member is released to move the blocking structure in the direction of the first position.

3,578,325
A BALL AND IMPACT MALLET
Roy K. Teas, 1100 Bluemont, Manhattan, Kans.
Filed Oct. 17, 1969, Ser. No. 867,142
Int. Cl. A63b *59/10, 67/00*
U.S. Cl. 273—56 **4 Claims**



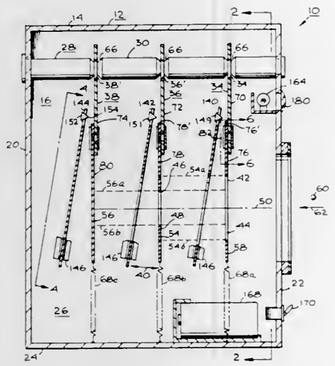
This invention is a game structure to be played on a given course area with the use of lifter structures, ball members usable with respective ones of the lifter structures, and various configurations of wicket members. More particularly, this invention relates to a lifter structure having a handle member connected to a head member whereupon the head member is provided with an outer inclined impact end section having a central groove to achieve two point contact with the ball member when striking and lifting the same.

3,578,326
AIR OPERATED AMUSEMENT DEVICE
Richard L. Brown, 1812 Pelton Ave., Bellevue, Nebr.
Filed Feb. 27, 1969, Ser. No. 803,005
Int. Cl. A63b *71/00*
U.S. Cl. 273—101 **24 Claims**



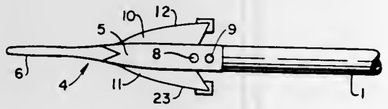
This invention relates to an amusement apparatus for use in amusement parks and like places in which a number of successive contestants may try their skill in the operation thereof. The air operated amusement device comprises a compressed air source adapted to direct an airstream through a specially mounted upright elongate nozzle to propel a lightweight spherical body located within an enclosure toward one or more elevated targets located therewithin. The amusement device is a preferred form further comprises a pair of manual-controls including a first control-lever adapted to control the airflow rate through the nozzle and including a second control-lever adapted to position the nozzle axis within a continuous plurality of conical loci of selectable slopes with a common apex surrounding a vertical datum axis whereby simultaneous manipulation of the two control levers permits tridirectional aerodynamic movement of the spherical ball toward the several targets including targets horizontally offset from the vertical datum axis.

3,578,327
TARGET PROVIDING AN INDICATING SIGNAL UPON IMPACT BY A PROJECTILE OF A PARTICULAR PORTION OF THE TARGET
Calvin D. Pickell, Woodland Hills, and Maury Klevens, Los Angeles, Calif., assignors to Marksman Manufacturing Corporation
Filed Sept. 18, 1968, Ser. No. 760,411
Int. Cl. F41j *5/04*
U.S. Cl. 273—102.2 9 Claims



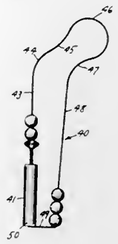
There is disclosed herein an improved target arrangement for providing a preselected indicating signal upon impact of a projectile upon particular portions of the target. A plurality of target rings, each having a projective impingeable area, are pivotally mounted in a spaced apart relationship so that apertures in the first and all intermediate target rings provide a projectile passageway therethrough. A device to stop the target is provided behind each target ring to limit the pivotal angular movement of the target ring when that particular target ring is struck by a projectile. The pivotal motion of each of the target rings is highly damped, and when the target ring contacts the stop device there is generated an indicating signal unique to that particular target ring so that it may be easily determined which target ring was struck by the projectile.

3,578,328
ARROWHEAD WITH PIVOTED BLADES
Donald H. Rickey, 1521 Carlisle Ave., Richmond, Va.
Filed Aug. 9, 1968, Ser. No. 751,410
Int. Cl. F41b *5/02*
U.S. Cl. 273—106.5(B 3 Claims



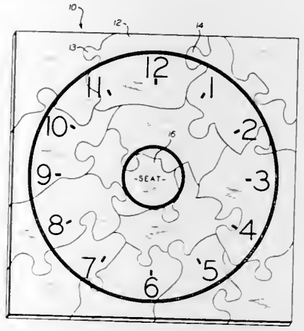
An arrow head having sharpened blades pivotally mounted in a slot in the head and constructed and arranged, in response to impact with and penetration into a target, to automatically pivot outwardly from a first position wherein the forwardly directed points of the blades are confined within the slot, to a second position wherein they are fully extended. Each blade is essentially planar and is provided with an integral radial extension or lug which in first position projects outwardly from the confines of the slot, and which may not only assist in pivoting it from first to second position, but also in cooperation with stop means fixed with the head, positively limit movement thereof to second position while permitting ready withdrawal of the head.

3,578,329
A WIRE LOOP AMUSEMENT GAME
Louis Biedny, 27 Patton Drive, Somerset, N.J. 08873
Filed May 26, 1969, Ser. No. 827,629
Int. Cl. A63f *7/00*
U.S. Cl. 273—119 4 Claims



An amusement device including a base element, a wirelike guide element supported by said base element and extending upwardly therefrom, the guide element having a downwardly extending loop. A compressible resilient means surrounds the guide element and rests on the base element, said resilient means supporting selectively a plurality of weighted members which slide on the guide element, whereby depending upon the degree of compression of said resilient element, upon release, one or more of said weighted members are urged past the downwardly extending loop portion of the guide element.

3,578,330
JIGSAW PUZZLE OF A SIZE REQUIRING LARGE MUSCLE EXERCISE
Irving Brambier, 841 Duncan Drive, Westbury, N.Y.
Filed May 1, 1968, Ser. No. 725,781
Int. Cl. A63f *9/12*
U.S. Cl. 273—157 3 Claims

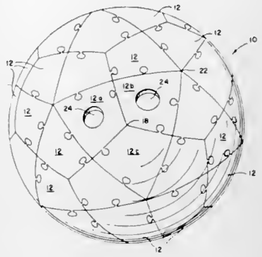


A jigsaw puzzle formed by a plurality of relatively large interlocking pieces providing for large muscle activity, with the assembled puzzle having an upper surface bearing a pictorial scene having an area for occupancy by a participant in the pictorial scene, so that the player may assume a position on said puzzle when the pieces are in assembled relationship with the player forming a part of the assembled scene.

3,578,331
THREE DIMENSIONAL PUZZLES
Hilaire G. DeGast, 1508 N. Quinn St., Arlington, Va.
Filed Feb. 20, 1969, Ser. No. 800,858
Int. Cl. A63f *9/12*
U.S. Cl. 273—157R 3 Claims

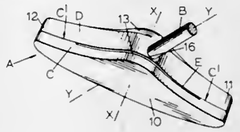
Three-dimensional puzzles are disclosed for forming a hollow ornamental object having a surface of revolution. The surface is formed, for the most part, of a plurality of substantially identical puzzle pieces each of which has projections

and complementary recesses about its periphery for cooperation with corresponding complementary recesses and projections on a contiguous piece. In one embodiment, the surface



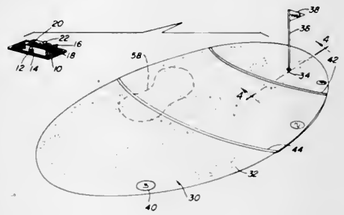
is a sphere, and the pieces are arranged in sets forming triangular and pentagonal portions of the spherical surface. In a second embodiment, the surface of revolution is cylindrical. A pair of such cylindrical surfaces intersect to form a cross.

3,578,332
GOLF PUTTER WITH CENTRALLY LOCATED SPHEROIDAL ENLARGEMENT
Stanley Benson Caldwell, The Royd, Meols Drive, Hoylake, England
Filed Sept. 3, 1968, Ser. No. 756,955
Claims priority, application Great Britain, Sept. 9, 1967, 41266/67
Int. Cl. A63b *53/04*
U.S. Cl. 273—164 2 Claims



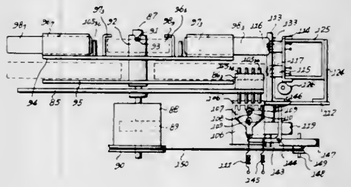
This invention relates to a putter which comprises a head formed with a medial, upwardly and rearwardly extending spheroidal enlargement having its center of curvature in line with the upper edges of the heel and toe of said head, and a shaft the axis whereof intersects the transverse axis of said spheroidal enlargement.

3,578,333
PRACTICE GOLF GREEN INCLUDING UNDULATED AREA AND THICKENED TAPERED CUP RECEIVING END PORTION
Joseph Elesh, Skokie, Ill., assignor to International Recreation Products, Inc.,, Skokie, Ill.
Filed Mar. 24, 1969, Ser. No. 809,540
Int. Cl. A63b *67/02*
U.S. Cl. 273—176R 1 Claim



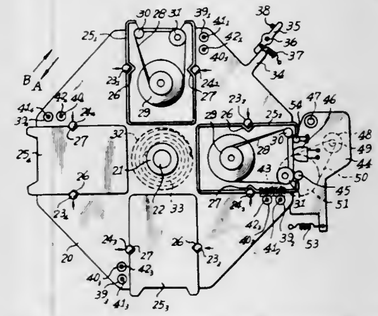
The disclosure describes a golf game for both indoor and outdoor use comprising a mat with a clipping tee and a driving tee thereon and an artificial golf green having a cup and flag, with indicia on the surface of the green marking off areas progressively further away from the cup, with values assigned to the green areas for evaluating golf shots to the green. The green includes an undulated area and a thickened tapered end portion including an integral molded cup of regulation size. The mat and green are separable so that the distance between them can be varied at will depending on the space available. The device can be used with either a practice ball or a regular golf ball.

3,578,334
AUTOMATIC PLAYING APPARATUS UTILIZING PLURALITY OF ENDLESS TAPE CARTRIDGES
Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo-to, Japan
Filed Mar. 18, 1968, Ser. No. 713,656
Claims priority, application Japan, Mar. 18, 1967, Mar. 23, 1967, Apr. 14, 1967, 42/16625;42/17679;42/23425
Int. Cl. G11b *5/54, 15/28;* B65h *19/06*
U.S. Cl. 274—4 9 Claims



An automatic playing apparatus for use with a plurality of endless tape cartridges comprising a planar base radially carrying and rotatably moving the plurality of the cartridges, a mechanism arresting movement of the casing to position the indexed cartridge in the play position, a pivotally movable deck including a magnetic head, and a capstan engageable and disengageable with the tape, a pinch roller therethrough when the cartridge in the play position, and so provided that the deck is moved from the base by deck driving means which are actuated upon searching an end mark signal on the tape for which time movement of the casing is effected to bring the next indexed cartridge into the play position or to change over a sound track on the tape.

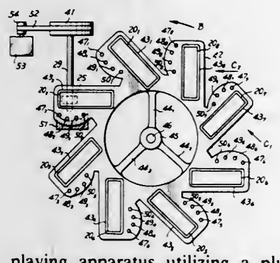
3,578,335
SOUND TRACK CHANGEOVER DEVICE FOR AUTOMATIC PLAYING APPARATUS HAVING A PLURALITY OF ENDLESS TAPE CARTRIDGES
Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo-to, Japan
Filed Mar. 18, 1968, Ser. No. 713,657
Claims priority, application Japan, Mar. 18, 1967, Mar. 23, 1967, Apr. 11, 1967, Apr. 14, 1967, Apr. 14, 1967, Apr. 14, 1967, 42/16625; 42/17679; 42/23425; 42/22612; 42/23426; 42/23429
Int. Cl. B65h *19/00;* G11b *15/66;* G03b *21/04*
U.S. Cl. 274—4 9 Claims



A sound track changeover device for an automatic playing apparatus having a plurality of endless tape cartridges

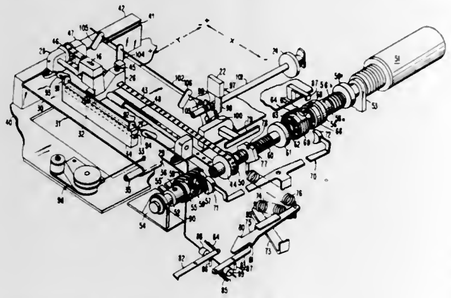
wherein a plurality of pushbutton rods are provided, corresponding to each of the cartridges and are adapted to index not only the cartridges in the play position but also the sound track when said pushbutton rod is depressed while movement of a housing is arrested at the same time the sound track is indexed when the depressed pushbutton rod is engaged with the stop member to depress an operating rod for a switch and the like which is provided to correspond to each sound track.

3,578,336
AUTOMATIC PLAYING APPARATUS UTILIZING PLURALITY OF ENDLESS TAPE CARTRIDGES
Itsuki Ban, 829, Higashi-Oizumimachi, Nerima-ku, Tokyo-to, Japan
Filed Apr. 12, 1968, Ser. No. 720,848
Claims priority, application Japan, Apr. 14, 1967, Apr. 14, 1967, 42/23425;42/23428
Int. Cl. G11b *5/54, 15/28;* **B65h** *19/06*
U.S. Cl. 274—4 **5 Claims**



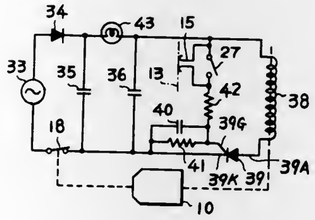
An automatic playing apparatus utilizing a plurality of endless tape cartridges, comprising a movable housing within which a plurality of endless tape cartridges are arranged in a manner that each of them is inclined to a radius drawn from the center of rotation of the housing thereof, means for arresting movement of the housing to bring a preselected endless tape cartridge into the play position, a swingable deck including a magnetic head and a capstan adapted to abut against the endless tape and a pinch roller in the cartridge, respectively, when the cartridge is in the play position, whereby said deck is swung away from the selected cartridge when reproduction of the endless tape within the cartridge is completed, and a capstan into abutment with a pinch roller or out of abutment therewith is effected, movement of the housing is admitted when the pinch roller is away from the capstan to bring a next preselected cartridge into the play position and to change over a sound track when desired.

3,578,337
REVERSIBLE DRIVE FOR TRANSDUCER USED IN A RECORDING AND REPRODUCING APPARATUS
Walter F. Klein, Lexington, Ky., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 20, 1968, Ser. No. 777,327
Int. Cl. G11b *5/02*
U.S. Cl. 274—4 **8 Claims**



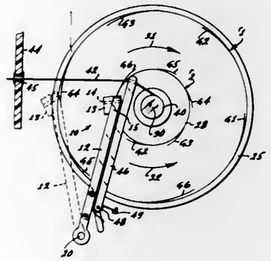
A transducer is driven in reciprocating motion relative to a recording medium for scanning the medium by attaching a band having apertures therein to the transducer. Rotating means has means to engage the apertures in the band to provide positive engagement between the rotating means and the band. The direction of rotation of the rotating means is reversed at each end of scanning by the transducer. The change in direction of rotation of the rotating means is accomplished through a pivotally mounted member that locks a ball retaining member against rotation.

3,578,338
TAPE CARTRIDGE REJECTION APPARATUS
Yoshihiro Ueno, Hujisawa, Japan, assignor to Victor Company of Japan, Limited, Moriya-Cho Kanagawa-Ku, Yokohama, Japan
Filed Dec. 16, 1968, Ser. No. 784,163
Claims priority, application Japan, Dec. 19, 1967, 42/105912
Int. Cl. G11b *5/78*
U.S. Cl. 274—4 **7 Claims**



A tape cartridge rejection apparatus having a plunger mainly operably by a discharge current of a condenser for rejecting and pushing out a tape cartridge, a normally-opened switch being closed when said tape cartridge is loaded in the tape player unit before rejection, resistor such as an incandescent lamp greatly variable in value corresponding to the flowing time of electric current, and a power source which charges electricity in said condenser through said resistance. The resistance serves to limit the electric current supplied to said plunger when said tape cartridge is not rejected although the plunger is energized and to prevent the burning of said plunger.

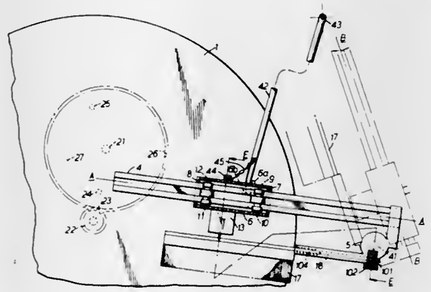
3,578,339
TONE ARM ASSEMBLY IN A TOY SOUND REPRODUCING DEVICE
William F. Summerfield, Huntington Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 17, 1969, Ser. No. 805,942
Int. Cl. G11b *3/00, 3/62, 3/10*
U.S. Cl. 274—9 **12 Claims**



A tone arm assembly, including a stylus which is supported in a rolling block, for use in a toy sound reproducing device, of the type in which a sequence of sounds, representing a saying or the like is reproduced during Play, when the stylus follows in a sound groove in a record, rotatable in a Play direction. The rolling block is shaped and the stylus supported therein, so that when the record is rotated in the Re-

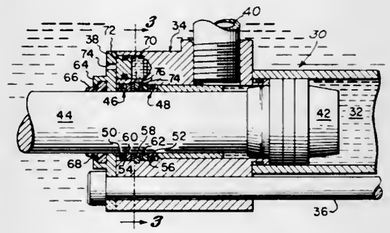
wind direction, opposite the Play direction, the moving record causes the block to pivot so that a rounded part thereof, rather than the stylus, engages the record as the arm is pivoted toward a Start of Play position. When the record starts turning in the Play direction, it pivots the block so that when the stylus finally engages a groove, the block is locked in a Play direction to enable the stylus to follow the engaged groove.

3,578,340
RECORD PLAYERS
Henry James Fortune, Swindon, England, assignor to The Plessey Company Limited, Ilford, England
Filed Dec. 16, 1968, Ser. No. 783,883
Claims priority, application Great Britain, Dec. 22, 1967, 58387/67
Int. Cl. G11b *17/08*
U.S. Cl. 274—15 **10 Claims**



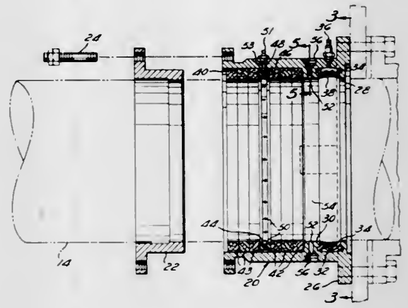
A record player employs parallel tracking by having an arm extending across the playing surface during play with a pickup cartridge arranged to run along a track along the arm while its position is measured or determined according to the point in the changing cycle by a low mass swinging arm extending more or less at right angles to the track. The arm carrying the track is arranged to be swung to a position clear of the record during the actual record changing operation of the cycle.

3,578,341
SEAL ASSEMBLY FOR A HYDRAULICALLY OPERATED CYLINDER
Arthur H. Le Febrve, Washington Township, N.J., assignor to Singer-General Precision, Inc., Little Falls, N.J.
Filed May 21, 1968, Ser. No. 730,801
Int. Cl. F16j *15/00*
U.S. Cl. 277—3 **10 Claims**



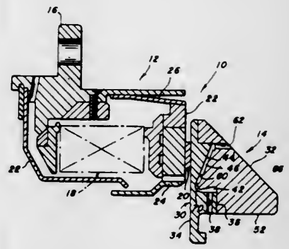
A seal assembly for a hydraulically operated cylinder comprising a pair of sealing members acting between the cylinder end cap and the operating shaft to seal the hydraulic operating fluid from the ambient fluid. A pressurized fluid is disposed between the sealing members and acts on the shaft to control the pressure differentials across each of the sealing members.

3,578,342
SHAFT SEAL
James Glenn Satterthwaite, 5001 Dogwood Trail, Portsmouth, Va., and James B. Macy, Jr., 107 River Drive, Morehead City, N.C. 28557
Filed Jan. 14, 1969, Ser. No. 791,082
Int. Cl. F16j *9/00, 15/46*
U.S. Cl. 277—9 **6 Claims**



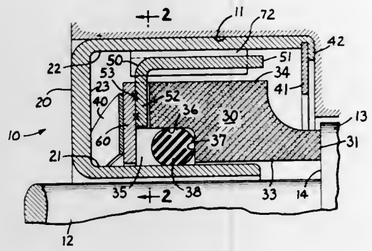
There is a shaft seal characterized by an inflatable seal and compressible packing seal means arranged in tandem about a shaft and including between the two sealing means, fluid inlet means for admission of lubricating fluid for a stern tube bearing. The inflatable seal is constructed and arranged to insure it does not contact the shaft excepting when its operation as a seal is desired. These devices are particularly useful as journal seals in marine installations for shafts extending through a vessel or hull.

3,578,343
ANNULAR SHOULDER ASSEMBLY FOR A ROTATING SEAL
Ernest J. Taschenberg, Baltimore, Md., assignor to Koppers Company, Inc.
Filed Apr. 24, 1969, Ser. No. 818,963
Int. Cl. F16j *15/00, 15/40*
U.S. Cl. 277—16 **7 Claims**



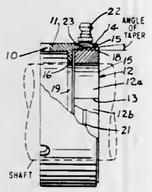
This disclosure relates to an annular shoulder assembly for a rotating seal. The shoulder assembly has an annular reservoir connected to an annular cooling chamber. An annular orifice is provided between the reservoir and the cooling chamber to control the distribution of coolant supplied to the cooling chamber from the reservoir. The annular cooling chamber extends rearwardly from the front planar surface and the coolant fluid, by the centrifugal force exerted during rotation of the annular shoulder assembly, forms a uniform film on the annular walls of the chamber to cool the annular shoulder assembly.

3,578,344
CARTRIDGE TYPE SEAL HAVING IMPROVED ANTI-ROTATION MEANS
Kermit D. Yost, Skokie, Ill., assignor to Rex Chainbelt, Inc., West Milwaukee, Wis.
Filed Nov. 5, 1969, Ser. No. 874,131
Int. Cl. F16j *9/00, 15/40*
U.S. Cl. 277—40 **12 Claims**



A cartridge-type seal having an annular stator of carbon or the like running in engagement with a rotor on a shaft in which the stator has an antirotation arm secured to its rear end surface and which extends to a position alongside the stator. The arm cooperates with antirotation lugs mounted inside the cylindrical wall of the seal housing to block rotation while permitting the stator to move endwise in the housing free of any possibility of localized chafing at the stator surfaces. In a preferred embodiment two of such antirotation arms are used arranged at diametrical points on a flat annular yoke which is keyed at spaced points to the rear end surface of the stator.

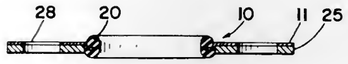
3,578,345
MECHANICAL SEAL INSERTS
John C. Copes, 2750 McConnell Drive, Baton Rouge, La.
Continuation-in-part of application Ser. No. 423,203, Jan. 4, 1965, now abandoned. This application Feb. 3, 1969, Ser. No. 804,044
Int. Cl. F16j *15/16*
U.S. Cl. 277—81 **16 Claims**



Split critically tapered inserts adapted for relatively rotatable in radial face-to-face contact to form a sealing surface when one is carried in a stationary member as the hub part of a frame, and the other carried by a holder on the shaft. Special critically dimensioned grooves convey pressurized fluid to the inserts which act through the effective radial component of area thus provided, easily to eject the inserts. The inserts have contact rings of specially hardened, more expensive material bonded therein to be ground and lapped for final finish contact in rotation.

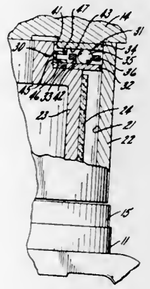
3,578,346
SEALED JOINT AND GASKET THEREFOR
Jerry G. Jelinek, Whittier, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio
Filed Jan. 29, 1969, Ser. No. 794,935
Int. Cl. F16j *15/08, 15/10*
U.S. Cl. 277—180 **21 Claims**

A joint and a gasket therefor in which the gasket comprises a resilient member attached to an offset portion of a first rigid plate. A second rigid plate is adjacent the first plate and surrounds the resilient member but is unattached to either so



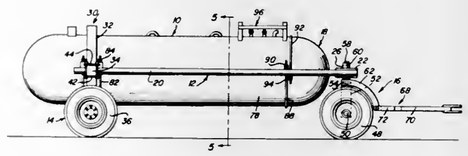
that it may be reused with a new first plate and elastometric member if the latter becomes worn out or damaged.

3,578,347
INSTRUMENT PANHEAD SEAL
Chadwell O'Connor, 1596 Mountain St., Pasadena, Calif.
Filed July 17, 1969, Ser. No. 842,451
Int. Cl. F16j *15/32*
U.S. Cl. 277—205 **1 Claim**



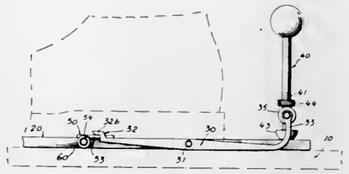
A rotary seal for instrument panheads in which the seal is a unitary annular body of Teflon formed with two seating surfaces in contact with the sides of a sealing region and one sealing surface in light resilient contact with a relatively rotatable surface against which the seal must be made. In one form, the annular seal body is U-shaped in cross section with a lip being formed on one leg of the U to define the sealing surface. In another form, the seal is shaped as a Belleville washer. In each case, pressure within the chamber being sealed acts to urge the sealing surfaces more tightly against the sides of the sealing recess.

3,578,348
FERTILIZER TRAILER
Richard F. Reinke, P.O. Box 272, Deshler, Nebr.
Filed Dec. 10, 1968, Ser. No. 782,624
Int. Cl. B60p *3/22*
U.S. Cl. 280—5 **8 Claims**



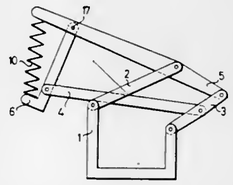
A wheeled fertilizer trailer wherein the tank is mounted within a wheeled frame to present a low profile and lower the center of gravity of the trailer. The frame having a relatively high location relative to growing crops and having very small projections on the bottom thereof, the clearance for crops is higher than conventional fertilizer trailers wherein the tank is mounted on top of the wheeled trailer.

3,578,349
SAFETY SKI BINDING
James Mitchell Edmund, 6404 Ridge Drive, Washington, D.C.
Filed May 26, 1969, Ser. No. 827,558
Int. Cl. A63c *9/086*
U.S. Cl. 280—11.35 **22 Claims**



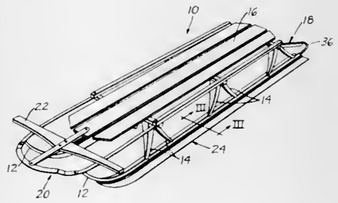
A safety ski binding in which the boot is secured to the ski by means of a plate fastened to the boot sole intermediate its heel and toe.

3,578,350
SAFETY HEEL SKI BINDING
Willy Suhner, Aarauerstr. 38, Brugg, Switzerland
Filed June 26, 1969, Ser. No. 836,840
Claims priority, application Switzerland, Nov. 14, 1968, 16998/68
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35T **21 Claims**



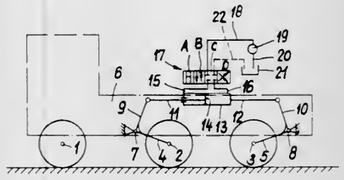
A step-in safety heel ski binding wherein a heel-holding link is movable by the ski boot from a raised position to a lower position and is moved into engagement with parts fixed to the ski in a first intermediate position which is nearer to the lower position than a second intermediate position in which the link is released from such parts on forcible movement from lower position toward raised position. A spring is stressed during movement of the link from raised position to first intermediate position and biases the link from first intermediate position to lower position.

3,578,351
AUXILIARY SLIDE MEMBER FOR MOUNTING ON SLED RUNNER
Regis Aloysius McAtee, R.D. 5, Box 356, Latrobe, Pa.
Filed Apr. 9, 1969, Ser. No. 814,679
Int. Cl. B62b *17/02*
U.S. Cl. 280—28 **14 Claims**



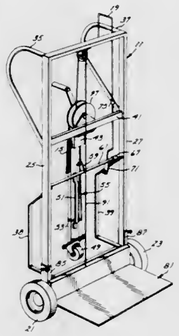
The invention relates to an auxiliary slide member for mounting on a sled runner, characterized in that the slide member has substantially greater width than the sled runner and is flexible so as to conform to the contour of the sled runner, and has a channel formed on top for receiving the sled runner, whereby the auxiliary member can be telescoped over the sled runner from the back and then fixed thereto.

3,578,352
VEHICLE WITH FRAME ADAPTED TO BE RAISED AND LOWERED
Franz Heine, Essen, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Feb. 14, 1969, Ser. No. 799,247
Claims priority, application Germany, Feb. 16, 1968, P 16 80 141.5
Int. Cl. B62d *21/18*
U.S. Cl. 280—43.23 **7 Claims**



A vehicle with a plurality of axles or axle groups supported by angle levers in which said angle levers are adapted to be interconnected by coupling rod means which have associated therewith hydraulically operably cylinder piston means operable to act upon said angle lever means so as selectively to raise and lower the vehicle body relative to the wheels supported by the axles or axle groups.

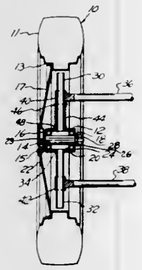
3,578,353
HANDTRUCK APPARATUS
Robert J. Lockhart, 552-C, East Central Park Ave., Anaheim, Calif.
Filed May 19, 1969, Ser. No. 825,723
Int. Cl. B62b *3/02*
U.S. Cl. 280—47.2 **10 Claims**



A handtruck apparatus comprising a vertical frame supported on a pair of support wheels and including a pair of support handles at its upper extremity. A brace is pivotally supported on its upper end from the frame and includes a third wheel carried from its bottom extremity. A spring is connected between the brace and the frame in an over-the-center-type arrangement to normally bias such brace to its retracted position adjacent the frame and, when the brace is pivoted to an intermediate position, to bias such brace to its extended supporting position. A transverse pivot rod is carried from the frame and includes a first lever arm connected with an upwardly projecting actuating handle disposed adjacent one of said support handles and a second lever arm

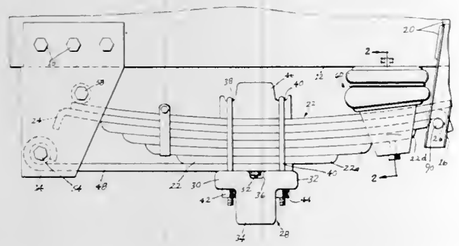
pivotally connected with a strut which engages the lower extremity of the brace whereby raising of the actuating handle kicks the lower extremity of the strut rearwardly to pivot the brace rearwardly to said intermediate position to enable the spring to pivot it to its supporting position.

3,578,354
VEHICLE SUSPENSION
Lawrence A. Schott, 15940 Warwick, Detroit, Mich.
Continuation-in-part of application Ser. No. 718,639, Apr. 3, 1968, now abandoned. This application Nov. 12, 1969, Ser. No. 875,953
Int. Cl. B60g *3/00*
U.S. Cl. 280—96.2 **3 Claims**



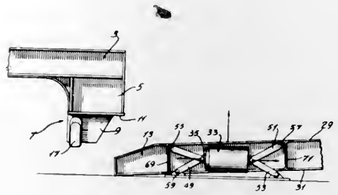
A vehicle suspension system wherein each wheel of the vehicle is supported on a spindle rotatably carried within a hub housing provided with a pair of radially extending pins having a common axis perpendicular to the axis of the spindle. A pair of frame supporting arms rigidly connected to the frame of the vehicle are slidably engaged by the pins for relative vertical and rotational movements respectively along and about the pin axis. A coil spring wound around the upper pin intermediate the hub housing and the upper frame supporting arm absorbs shock loads received by the wheel as it travels over irregularities in a road surface. A tie bar connected to the hub housing and adapted to be displaced in a horizontal plane by a suitable steering mechanism rotates the hub housing and the pins relative to the frame supporting arms to permit steering of the vehicle.

3,578,355
AIR SUSPENSION SYSTEM
Carl E. Oeder, 256 Shawhand Road, Morrow, Ohio
Filed Jan. 29, 1969, Ser. No. 795,118
Int. Cl. B60g *11/46*
U.S. Cl. 280—124 **6 Claims**



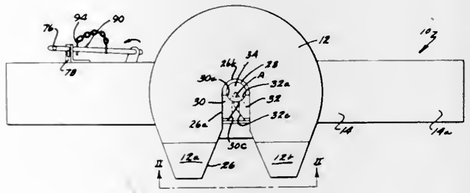
An air suspension leaf spring assembly for drop center axles used on vehicles, such as trucks and the like. The leaf spring is secured to the axle at its center and suspended from the vehicle frame at an intermediate point by an air spring, with the ends of said leaf spring being free to move in a restricted vertical path.

3,578,356
DETACHABLE GOOSENECK
Maurice Moiriat, 8490 Clark St., Montreal, Quebec, Canada
Filed May 2, 1969, Ser. No. 821,397
Int. Cl. B62d *53/06*
U.S. Cl. 280—425 **5 Claims**



A trailer wherein a depressed load bed is coupled at one end to a gooseneck which is mounted at the rear of a tractor. The depressed load bed comprises at least two spaced-apart and longitudinally disposed beams. A pair of hydraulic pistons are horizontally mounted underneath the load bed, either longitudinally or transversely with respect to the beams and each of the hydraulic piston are connected at each end thereof to the articulation of a toggle mechanism. The toggle mechanism is pivotally connected at one end thereof to one of the beams and at the other end thereof to a ground-engaging footplate. The hydraulic pistons are dimensioned to fit within an enclosure defined by the upper and lower surfaces of the beams and are movable from a retracted position within said enclosure to an extended position whereby the end of the trailer may be uncoupled from the gooseneck and lowered to any desired position.

3,578,357
FIFTH WHEEL LOCK ASSEMBLY
Clarence N. Bouman, Holland, and Fred Bakker, West Olive, Mich., assignors to Holland Hitch Company, Holland, Mich.
Filed Dec. 27, 1968, Ser. No. 787,482
Int. Cl. B62d *53/12*
U.S. Cl. 280—434 **2 Claims**

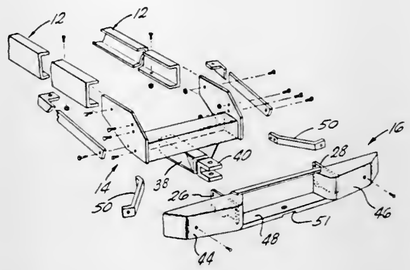


A kingpin lock assembly for a vehicular-hauling hitch, especially the fifth-wheel type, using overlapping retention jaws giving full peripheral pin engagement, the jaws sliding laterally together in retention tracks generally transverse to the usual direction of the hauling force.

3,578,358
FRAME HITCH AND STEP BUMPER
Donald F. Reynolds, 4415 E. Textile Road, Ypsilanti, Mich.
Filed Aug. 19, 1969, Ser. No. 851,212
Int. Cl. B60d *1/14*
U.S. Cl. 280—500 **6 Claims**

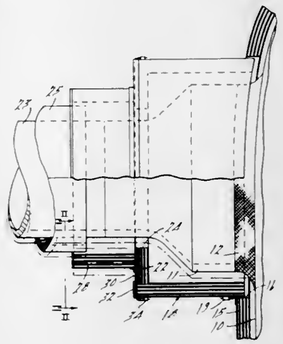
An accessory for mounting on the frame of a motor vehicle, to provide a frame hitch assembly adapted to be used with the original equipment bumper of the vehicle or which is adapted to support an accessory step bumper. The frame

hitch assembly has mounting end plates and reinforcing torque bars adapted for mounting the hitch assembly on the



frame without altering the physical characteristics of the frame.

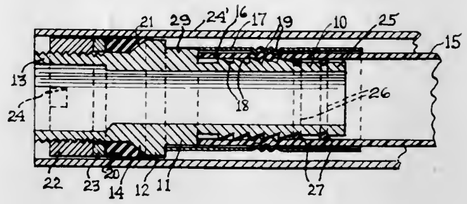
3,578,359
RIGID REFLECTIVE HEAT INSULATION
James E. Smith, and Carl W. Schulz, Lancaster, Ohio, assignors to Diamond Power Specialty Corporation
Filed Sept. 4, 1969, Ser. No. 855,271
Int. Cl. F16l *59/14*
U.S. Cl. 285—47 **4 Claims**



Sectional prefabricated thermal insulating elements for projecting portions of large structures having inaccurately positioned components, such as the nozzles of reactor vessels, are formed in semicylindrical parts of different diameters held together against longitudinal separation by overlapping sheet metal parts which permit them to move transversely of each other and of the longitudinal axis. The parts are buckled together and separable both longitudinally and transversely of the axis.

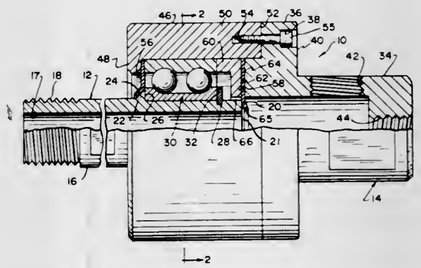
3,578,360
FITTING FOR A LINER PIPE FORMED OF POLYETHYLENE
Sol S. Eliot, Chicago, Ill., assignor to Perfex Plastics, Inc., Chicago, Ill.
Filed July 16, 1969, Ser. No. 842,248
Int. Cl. F16l *9/14, 33/20*
U.S. Cl. 285—55 **1 Claim**

A fitting for a liner pipe formed of plastic material such as polyethylene, the fitting having an enlarged shoulder, a boss, and a stud with circumferentially extending spaced-apart steps or ribs insertable in the end of the liner pipe. The shoulder is circumferentially beveled at one edge. A pliable compression ring is forced and compressed against the adjacent walls of a pipe within which the liner pipe is arranged and the fitting, to provide an effective seal and connection between the fitting and the pipe. The liner pipe is inserted upon the stud within a sleeve press-fitted on the boss, the sleeve and liner pipe being crimped to engage between the



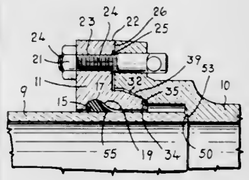
steps to provide connection between the liner pipe and the stud.

3,578,361
ROTARY COUPLING AND SEAL COMBINATION
John E. Corrigan, Evanston, Ill., assignor to The Roy M. Moffitt Company
Filed May 12, 1969, Ser. No. 823,914
Int. Cl. F16l *17/00*
U.S. Cl. 285—98 **8 Claims**



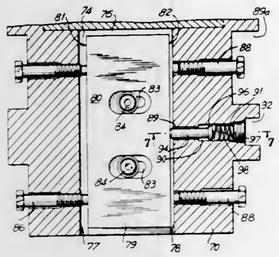
A rotary coupling having a seal member between members movable with respect to each other said seal member being composed of a nonporous, slippery, compressibly deformable and abrasive-resistant material and having a flange element extending radially inwardly into deflective engagement with a sealing face of the member rotating with respect to said seal member to define a fluidtight seal between the members of the coupling.

3,578,362
PIPE ADAPTER
Brian R. Cauthery, R.R. #1, Caledon, Ontario, Canada
Filed Feb. 27, 1969, Ser. No. 802,801
Int. Cl. F16l *17/02*
U.S. Cl. 285—110 **4 Claims**



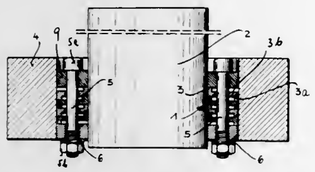
An adapter for sealing a plastic pipe to a cast iron bell fitting is provided with an internal dynamic seal to receive the plastic pipe in entered peripheral sealing relation within the adapter, and an axial end seal, with a compression shoulder to accept axial closing forces providing precise positioning of the end seal against a tapered inner surface of the bell fitting.

3,578,363
LOCKING KEY FOR COUPLING
Donald E. De Rocker, Ramsey, and Andrew J. Vaccaro, Little Falls, N.J., assignors to Sier-Bath Gear Co, Inc., Bergen, N.J.
Filed Apr. 28, 1969, Ser. No. 819,917
Int. Cl. F16d *1/06*
U.S. Cl. 287—52.05 **9 Claims**



A rotatable coupling includes a sleeve engaging a shaft having an end provided with opposite parallel flats, which end is received in the bore of the sleeve. The sleeve has a recess in its inner face with a flat base at a transverse angle to the confronting shaft flat and a wedge-shaped key is located in the recess with opposite converging faces engaging the shaft flat and recess base. Screws accessible externally of the sleeve engage tapped traverse bores communicating with the recess and bear on opposite ends of the key to permit its transverse adjustment. The opposite shaft flat is engaged by a confronting flat on the sleeve. A compression spring urges the key toward the deep side of the recess.

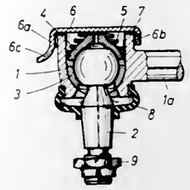
3,578,364
CONNECTING ARRANGEMENT
Hermann Ehrenberg, Lagen, Hessen, Germany, assignor to Fouquet-Werk Frauz & Planck, Rottenburg, Neckar, Germany
Filed Mar. 27, 1969, Ser. No. 811,145
Claims priority, application Germany, Dec. 30, 1968, P 18 17 398.3
Int. Cl. F16d *1/06*
U.S. Cl. 287—52 **16 Claims**



A substantially cylindrical inner member is surrounded with clearance by an annular outer member. Connecting means is located in this clearance in form of one or several axially consecutive annular members which in axial section are of substantially Z-shaped or substantially Y-shaped configuration and which, when subjected to axial stress, are spread radially into engagement with the opposed surfaces on the inner and outer member, thereby connecting the members against movement relative to one another.

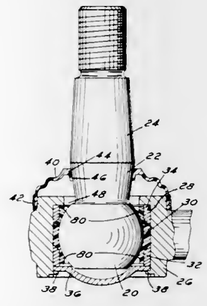
3,578,365
BALL AND SOCKET JOINT
Rudolf Gottschald, deceased late of Osterath by Erika Gottschald, sole heir, Osterath, Germany, assignors to A. Ehrenreich & Cie, Dusseldorf-Oberkassel, Germany
Filed Sept. 11, 1968, Ser. No. 759,827
Claims priority, application Germany, Sept. 14, 1967, P 16 25 532.6
Int. Cl. F16c *11/06*
U.S. Cl. 287—87 **3 Claims**

A ball and socket joint, particularly for the steering and tie rods of motor vehicles, comprising a housing having a cover



with a tear-off strip for facilitating removal of said cover.

3,578,366
BALL JOINT SELF-SEALING BEARING
Edward A. Snidar, Ann Arbor, Mich., assignor to O & S Bearing & Mfg. Co., Whitmore Lake, Mich.
Filed Nov. 28, 1969, Ser. No. 880,646
Int. Cl. F16c *11/06*
U.S. Cl. 287—90 **8 Claims**

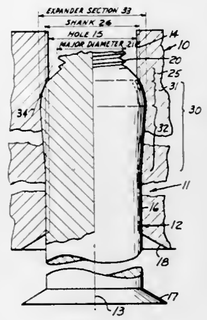


A long-life, self-lubricating, self-sealing bearing which utilizes a plastic insert assembly for carrying the bearing load backed up by a lubricant-impregnated material to serve as a resilient compression force in the bearing assembly and as a source of lubricant during the life of the bearing, the plastic assembly being formed of interlocking parts which provide a substantial body of load-carrying material at the equatorial surface of the joint and at the same time provides a resilient lip seal at each end of the joint to exclude contaminant material.

3,578,367
FASTENER INCLUDING EXPANDER MEANS AND JOINT INCLUDING THE SAME
Leonard A. Harvill, Santa Ana, and William E. Duncan, Garden Grove, Calif., assignors to Hi-Shear Corporation, Torrance, Calif.
Continuation of application Ser. No. 713,658, Mar. 18, 1968, now abandoned. This application Sept. 3, 1969, Ser. No. 857,293
Int. Cl. F16b *5/02*
U.S. Cl. 287—189.36 **11 Claims**

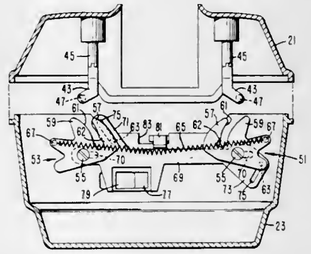
This invention relates to a fastener pin for making an interference fit with the cylindrical wall of a hole in a metal workpiece, and to a joint produced by this fastener pin together with the metal workpiece. During the insertion of the fastener pin into the hole, a temporary and localized expansion of the wall to a diameter greater than that of the shank with which the interference fit will be formed is caused. This temporary and localized expansion is to such an extent that the metal immediately surrounding the hole where the localized expansion occurs is compressed beyond its compressive yield point, after which at least a portion of the axial extent of the wall of the hole is permitted to return toward its original diameter, thereby to embrace in an interference fit at

least a portion of the pin. The joint produced by this technique enjoys the benefits of having worked the material surrounding the pin in its plastic range, after which it is permitted to return to make the interference fit. This enables the



wall of the hole to be burnished, to be made more truly cylindrical, and to reduce the compressive hoop force on the fastener pin with the correlative effects of reducing stress corrosion in the joint and of reducing galling and damage to the plating on the shank of the pin.

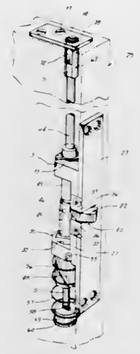
3,578,368
SAFETY COVER LOCK FOR THE CASE OF AN ELECTRICALLY OPERATED DEVICE
Guy-Louis Dupuis, Ilot C. Caudebec En Caux, France, assignor to Burroughs Corporation, Detroit, Mich.
Filed Jan. 6, 1969, Ser. No. 789,161
Int. Cl. E05c *3/26*
U.S. Cl. 292—45 **11 Claims**



The base and cover portions of a container intended for housing an electrically operated device are provided with latching means effective for securing the cover to the base when the device is in an operating state, and for conveniently removing the cover from the base for maintenance and repair purposes. The latching means cooperates with the electrical supply cord of the housed device in such manner as to require its disconnection therefrom, at its point of entry into the case, before the cover can be removed from the base, and to prevent its reconnection therewith until the latched relationship between the cover and the base is reestablished.

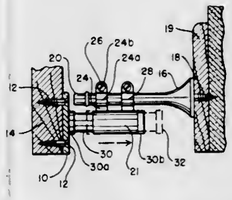
3,578,369
SELF-OPERATING EXTENSION FLUSH BOLT
Leo Coopersmith, Ivoryton, Conn., assignor to The H.B. Ives Company, New Haven, Conn.
Filed Apr. 2, 1969, Ser. No. 812,671
Int. Cl. E05c *5/00*
U.S. Cl. 292—58 **15 Claims**

There is disclosed a self-operating extension flush bolt mechanism for latching the inactive one of a pair of swinging doors, which is operated to latch the door, once the latter is closed, by swinging movement of the other or active door to the closed position. The latch mechanism includes a bolt which is driven home by gear means operated by a cam engageable by the active door. Thermal-responsive means may



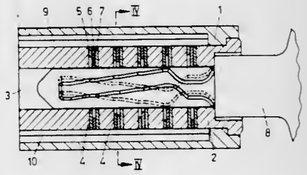
be provided to inhibit retraction of the bolt when the latter is subjected to high temperatures, as during a fire, such as those likely to cause buckling of the doors.

3,578,370
MAGNETIC DOOR STOP
James J. Greytok, 1123 Ashbridge Road, Rosemont, Pa.
Filed Apr. 11, 1969, Ser. No. 815,412
Int. Cl. E05c *19/16*; **E05d** *13/00*
U.S. Cl. 292—251.5 **11 Claims**



A door stop is provided with a magnetically susceptible element that may be aligned in cooperative relationship with a magnetically susceptible element of a door to provide magnetic means to secure the door in the open position. The magnetically susceptible element of the door stop may be moved, when desired, into a nonoperating position. In one optional form of this invention, provision is made for adjustably aligning the operating face of the magnetically susceptible element of the door stop to make planar contact with the door while in its open position.

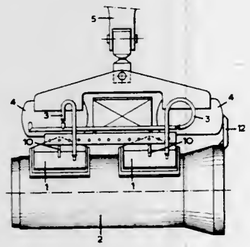
3,578,371
DISK TUMBLER CYLINDER AND KEY FOR A LOCK
Ernst Keller, 6, Querstrasse, 8805 Richterswil, Switzerland
Filed Feb. 10, 1969, Ser. No. 797,733
Claims priority, application Switzerland, Feb. 9, 1969, 1929/68
Int. Cl. E05b *15/14, 29/12*
U.S. Cl. 292—364 **7 Claims**



The lock plug has several slots, each holding three disc tumblers spring biased into locking positions, two of which

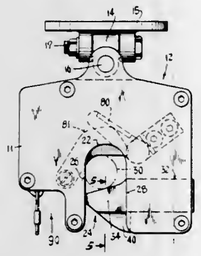
tumblers are moved up and the remaining one down by the key and its camming shoulders to release the rotatable plug.

3,578,372
SUCTION CUP STRUCTURE
Jacob Pieter Schuler, Soest, Netherlands, assignor to Handelmaatschappij Othene N.V., Soest, Netherlands
Filed Apr. 28, 1969, Ser. No. 819,667
Claims priority, application Netherlands, Apr. 29, 1968, Nov. 18, 1968, 6806080;6816396
Int. Cl. B66c *1/02*
U.S. Cl. 294—64 **5 Claims**



A suction cup structure for use in a lifting device to lift structural building elements, which is to be connected to a vacuum source and comprises a rubber sealing ring mounted in a circular groove around the opening of the suction cup, the configuration of which cup conforms to the relevant surface portion of the object to be lifted, said ring consisting of a plurality of layers of foam rubber succeeding each other from the inside to the outside about the opening of the cup, said layers being separated from each other by impenetrable layers of glue interconnecting the rubber layers.

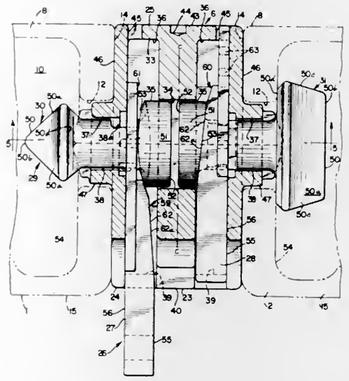
3,578,373
POWER OR MANUALLY RELEASED CARGO LATCH
Joseph R. Metz, Ridgefield, Conn., assignor to Norco, Inc., Ridgefield, Conn.
Filed Feb. 19, 1969, Ser. No. 800,475
Int. Cl. B64d *1/00;* **B66c** *1/00*
U.S. Cl. 294—83 **13 Claims**



A cargo latch releasable either electrically or at remote or proximal points manually, comprising a slide bolt movable across the mouth of the latch body. Control of the bolt movement is effected by a series of sears and levers arranged in a unique, compact and advantageous manner to give positive action, great strength and at the same time easy release.

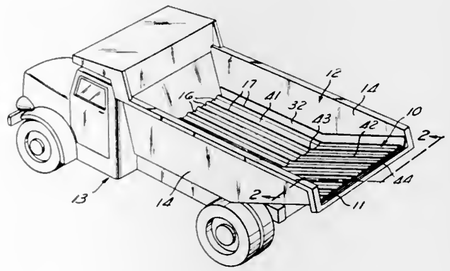
3,578,374
CONTAINER COUPLER ARRANGEMENT
John J. Glassmeyer, Covington, Ky., assignor to Pullman Incorporated, Chicago, Ill.
Filed May 22, 1969, Ser. No. 826,852
Int. Cl. B66c *1/10*
U.S. Cl. 294—67 **31 Claims**

For tandem coupling together of cargo containers of the highway trailer-type attendant to hoisting of the containers between land, sea or air transport means, an upper between-the-containers compression spacer block and a lower tension coupler between the containers wherein the lower coupler comprises a housing carrying a pair of longitudinally spaced rotatable container tandem locking clamps receivable in the corner fittings of tandem containers in locked and unlocked positions, key means slidable inwardly and outwardly of the housing and contained thereby for each clamp for rotating



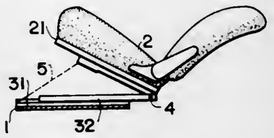
each clamp about an axis and moving each clamp independently of the other clamp along such axis between locked and unlocked positions and including complementary tooth means on the clamp and on the key means for clamp rotation and the key means having key wedge portions for moving each clamp axially and for limiting rotation of each locked clamp, and, key holder means for retaining the key means in the locked position in the housing.

3,578,375
CUSHIONING LINER FOR VEHICLES OR THE LIKE
Donald W. Finefrock, Massillon, Ohio, assignor to The Johnson Rubber Company, Middlefield, Ohio
Filed Feb. 24, 1969, Ser. No. 801,561
Int. Cl. B62d *33/00*
U.S. Cl. 296—39 **14 Claims**



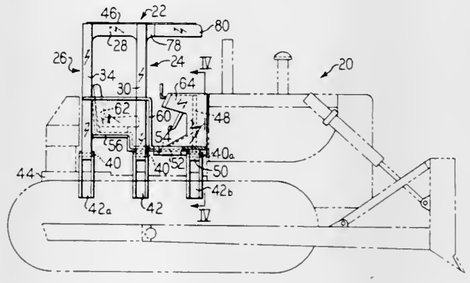
A cushioning liner is disclosed which combines a plurality of elongated elastomeric sheet members and a plurality of elongated elastomeric rib members mounted between adjacent edges of sheet members. The ribs are provided with T-shaped longitudinal slots along which metal plates extend to distribute clamping loads. Bolt fasteners are mounted in the plate at spaced intervals therealong to bolt the ribs to the supporting surface and in turn clamp the sheets in position. The ribs and sheets are provided with mating interlocking surface arranged so that they provide mutual lateral support.

3,578,376
SEAT CONSTRUCTION OF A VEHICLE
Tatsuo Hasegawa, Okazaki-shi; Kohichi Yoshie, and Yasuhiro Kamijima, Toyota-shi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota-shi, Japan
Filed Aug. 7, 1969, Ser. No. 848,302
Claims priority, application Japan, Sept. 20, 1968, 43/67598
Int. Cl. B60r *21/10;* **B60n** *1/02*
U.S. Cl. 296—65 **6 Claims**



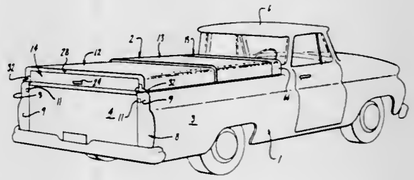
A seat assembly for a vehicle is composed of a floor, a seat, a movable support member supporting the seat to permit the seat to move relative to the floor, a pin or stationary member fixing the seat on the floor to prevent the seat from moving relative to the floor which includes a weak link or releasable section, and an energy absorbing member disposed between the floor and the seat. When an impact in the forward direction is applied to the seat by a rear-end-collision with a following car, if the impact force exceeds a predetermined permissible value, the stationary member is released to permit the seat to move rearwards relative to the floor by the inertia of the seat and passengers, and, simultaneously the energy absorbing member is deformed so as to reduce the impact imposed on the passengers and prevent them from being injured.

3,578,377
TILT OVER ROLL PROTEON FRAME WITH POWER TILTING MEANS
John H. Babbitt, Jr.; Max E. Butterfield, Peoria; Grant L. Nelson, Bartonville; Hugh V. Piper, Peoria, and Sheldon L. Stark, Bloomington, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Jan. 13, 1969, Ser. No. 790,797
Int. Cl. B62d *25/06*
U.S. Cl. 296—102 **17 Claims**



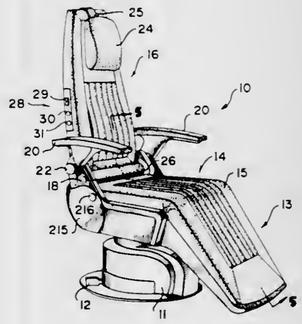
A roll protection frame, for mounting on a tractor or similar machine, which is fabricated to provide a maximum cross-sectional area of material in critical locations for adequate strength to protect the vehicle operator if the vehicle should roll over, and which has a reduced cross section in locations requiring less strength to eliminate excessive weight. The front of the frame is wider than the rear portion thereof so as to provide a more even distribution of impact forces when the vehicle is overturned. The frame is detachable and pivotally mounted on the machine and a hydraulic cylinder arrangement may be removably attached thereto for pivoting the frame, together with the operator's seat and console, to provide access to the machine components beneath the frame. The provision of a double holding valve within the removable tilting cylinder will allow the protection frame to be tilted and maintained in any desired position, without allowing it to fall over when it passes the center of gravity.

3,578,378
TELESCOPIC AND PIVOTAL COVER ASSEMBLY FOR OPEN BED VEHICLES
Edwin G. Anderson, 804 Northey Drive, Sacramento, Calif.
Continuation-in-part of application Ser. No. 618,099, Feb. 23, 1967, now abandoned. Filed Apr. 11, 1969, Ser. No. 815,309
Int. Cl. B60j *7/10*
U.S. Cl. 296—137 **40 Claims**



A telescopic cover assembly for open bed vehicles comprising a plurality of cover segments at least one of which is longitudinally movable. The movable segment carries wheel assemblies engageable with a guide rail along which the segment is movable. The guide rail is constructed to elevate the movable segment during movement towards an extended position. Cutouts are provided in the guide rail in which the wheel assemblies are engageable for maintaining the movable segment in predetermined locations. Improved mounting means for the guide rail, and improved gate closure structure also are included in the cover assembly. In a preferred embodiment, the cover is pivotal upwardly to permit unrestricted access to the vehicle bed.

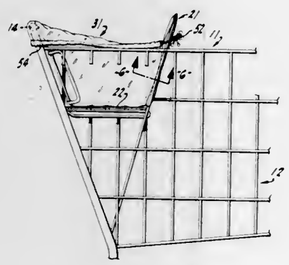
3,578,379
ADJUSTABLE CHAIR
Norris O. Taylor, Swarthmore, Pa.; Wilmer P. Uhler, Tottenville, Staten Island; John M. Gardella, Staten Island, N.Y., and Jim C. Cahlik, Parma, Ohio, assignors to Pennwalt Corporation
Division of Ser. No. 475,181, July 27, 1965, Pat. No. 3,414,-324. Filed Dec. 28, 1967, Ser. No. 722,504
Int. Cl. A47c *1/037, 1/04*
U.S. Cl. 297—7.1 **18 Claims**



A dental chair is equipped with a cushion roll between the backrest and the seat rest to provide a continuous supporting surface extending from the backrest to as far as the bottom of the leg rest. Single or dual controls are provided on the backrest, preferably along the opposite side edges of the backrest. Where dual controls are employed, a signal from a dental assistant's control will not operate the chair except in

the absence of a signal from the dentist's control, which preferably overrides the assistant's control. A shroud connected to the seat rest is biased into engagement with the backrest adjacent the pivotal connection of the backrest and seat rest. Continuous return of the backrest to upright position may be effected by a holding device incorporated in the control unit, with provision for deactivation when a control switch for reclining the backrest is subsequently actuated. During movement of the backrest to various angular inclinations the arm rest is maintained in substantially parallel relation to the seat rest.

3,578,380
SANITARY COVER FOR SHOPPING CART SEAT
Rosalind R. Jacobus, 1730 Gumwood Drive, Concord, Calif.
Filed Mar. 7, 1969, Ser. No. 805,194
Int. Cl. A47c *4/30*
U.S. Cl. 297—229 **6 Claims**

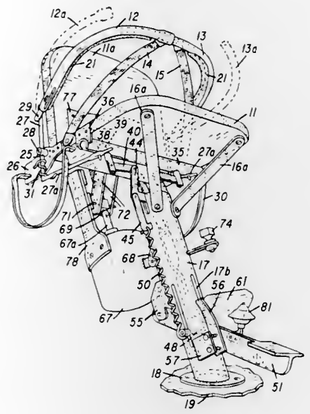


A thin sheet of pliable material configured to removably fit the seat of a conventional shopping cart in covering relation to all cart surfaces forming a portion of and adjacent to such seat. The sheet is formed of a double back portion slidable onto the back of a shopping cart seat, a central portion fitting the sides, bottom and front of the seat with openings in the front to match the cart seat openings and an edge portion disposable over the top cart bars and handle with elastic or tie means for securing the cover in position.

3,578,381
CONTROLLED MOTION AMUSEMENT DEVICE
James V. Young, Clayton, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Feb. 20, 1969, Ser. No. 800,920
Int. Cl. A47d *1/00*
U.S. Cl. 297—300 **10 Claims**

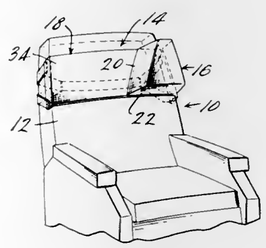
A pneumatic amusement device consisting of a resilient bellows and offering controlled but varied motion responses to the rider.

3,578,382
AUTOMATIC SAFETY SEAT CLAMP
Robert Servadio, 3721 Parkview Ave., Pittsburgh, Pa. 15213
Filed Mar. 5, 1969, Ser. No. 804,423
Int. Cl. B60r *21/10;* **A47c** *31/00*
U.S. Cl. 297—390 **11 Claims**



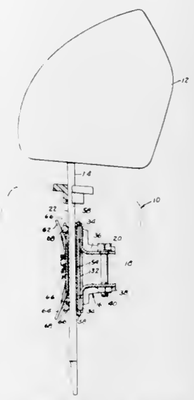
An automatic safety seat clamp adapted to be moved in front of an occupant of a vehicle seat, to restrain him from being thrown forwardly during an accident. The safety clamp is automatically raised from a low retracted position in response to the occupant's body pressure which actuates a switch on the seat backing. The clamp encircles the occupant in response to foot pedal action. The clamp is retracted by motor power in response to another foot pedal action.

3,578,383
PILLOW UNIT FOR A SEAT
Thad J. Earl, 1132 E. Second St., Defiance, Ohio 43512
Filed Mar. 3, 1969, Ser. No. 803,564
Int. Cl. A47c *7/36, 7/42*
U.S. Cl. 297—391 **7 Claims**



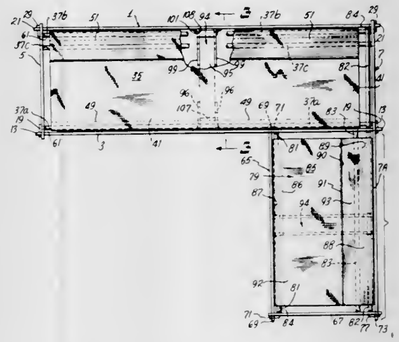
A pillow unit for the head of a person in a chair or in a vehicle seat is attached to the back of the seat and supports the head when the person is in a relaxed, sitting position. The pillow unit includes a pillow extending outwardly from the seat back a sufficient distance and at a proper angle to adequately support the head, and means for affixing the pillow to the seat at the level of the head and to one side of the center of the seat back. In a preferred form, the pillow is affixed to a base sheet which, in turn, is attached to the seat back by elastic straps or by means of Velcro, by way of example. Also in a preferred form, the pillow includes a cover and a removable pillow insert which can be removed for the purpose of cleaning the cover and the base sheet. If desired, two of the pillows can be employed with the base sheet spaced apart a distance sufficient to receive the person's head to support either or both sides thereof.

3,578,384
ADJUSTABLE HEADREST FOR VEHICLE SEATS
Ludwig Leichtl, Emmaus, Pa., assignor to McCord Corporation, Detroit, Mich.
Filed Nov. 25, 1968, Ser. No. 778,464
Int. Cl. A47c *7/36, 7/42*
U.S. Cl. 297—410 **16 Claims**



A headrest for a vehicle seat wherein the cushioned headrest pad has one or more vertically depending support arms thereon which are vertically slideable in support brackets mounted within the seat cushion. Each support bracket is formed with a guideway for receiving the associated support arm. Each support bracket has a pair of inclined tabs thereon, an upper tab inclining upwardly and away from the guideway and a lower tab inclining downwardly and away from the guideway to form with an axially extending surface portion of the support arm a pair of acute angle cavities. Cylindrical members are arranged in the cavities to form friction wedges and springs are connected with the cylindrical members to urge them into tangential contact with the tabs and with the support arm so that vertical movement of the support arm is yieldably resisted by the frictional wedge action of spring-biased cylindrical members.

3,578,385
DEMOUNTABLE SOFA OR CHAIR CONSTRUCTION
Karen R. Stiglitz, 4804 Chevy Chase Blvd., Chevy Chase, Md.
Filed Mar. 4, 1970, Ser. No. 16,350
Int. Cl. A47c *17/40, 4/02*
U.S. Cl. 297—440 **11 Claims**



The outer rigid frame is demountably fastened together by pins inserted in transverse openings formed in the outer exposed ends of tongues which are rigid with the ends of the front and back walls of the frame and which protrude through openings formed in the sidewalls of the outer frame. The cushion support is formed of strong fabric detachably connected to three parallel, elongated dowels removably mounted on the sidewalls of the frame.

CHEMICAL

3,578,386

DYEING HUMAN HAIR WITH BENZOTHIAZOLE AZO COMPOUNDS

Gregoire Kalopissis, Paris, and Andree Bugaut, Boulogne-sur-Seine, France, assignors to L'Oreal, Paris, France

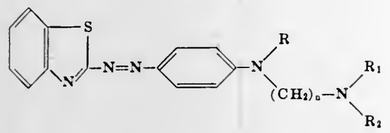
No Drawing. Filed Feb. 16, 1968, Ser. No. 705,925

Claims priority, application Luxembourg, Feb. 22, 1967, 53,050

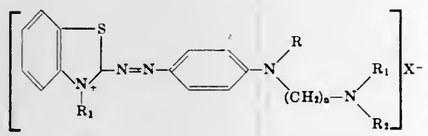
Int. Cl. A61k *7/12*

U.S. Cl. 8—10 **3 Claims**

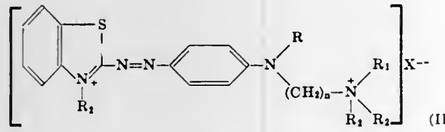
This invention relates to methods of dyeing and dyes for keratinic fibers, especially human hair with benzothiazole compounds corresponding to one of the following formulae:



(I)



(II)



(III)

In each of these formulae R, R_1 and R_2 may be lower alkyl radicals, but in some of the formulae they may be H or acyl radicals instead, as set forth in detail in the specification. Preferably R_1 and R_2 are combined with an adjacent N to form a heterocyclic radical falling within the group consisting of morpholino, piperidino and pyrrolidino radicals.

3,578,387

DYEING HAIR WHILE SIMULTANEOUSLY LIGHTENING ITS COLOR

Charles Zviak, Franconville, and Giuliana Ghilardi, Paris, France, assignors to L'Oreal, Paris, France

No Drawing. Filed Feb. 13, 1967, Ser. No. 615,330

Claims priority, application Luxembourg, Feb. 15, 1966, 50,461; Aug. 22, 1966, 51,804

Int. Cl. A61k *7/12*

U.S. Cl. 8—10.1 **6 Claims**

This invention relates to a process for simultaneously dyeing hair and lightening its color and to specific compositions for use in carrying out that process. These compositions contain in combination a water-soluble dye which is either an anthraquinone dye or a nitrated derivative of benzene, together with an azo dye or an anthraquinone dye which are insoluble in water, and hydrogen peroxide.

3,578,388

AQUEOUS DYESTUFF COMPOSITIONS CONTAINING 2,2' - (AZO-DIPHENYLENE)-BISBENZOTHIAZOLES AND ONE OR MORE DISPERSING AGENTS

Chi K. Dien, Buffalo, N.Y., assignor to Allied Chemical Corporation, New York, N.Y.

No Drawing. Original application Nov. 16, 1966, Ser. No. 594,662, now Patent No. 3,510,241, dated May 5, 1970. Divided and this application May 14, 1969, Ser. No. 842,054

Int. Cl. C09b *33/12;* **D06p** *1/18, 3/36*

U.S. Cl. 8—41 **2 Claims**

Dyestuff compositions comprising aqueous dispersions of 2,2'-(azo-diarylene)-bis-benzo thiazoles intimately mixed with one or more dispersing agents useful in coloring in yellow to orange shades aromatic polpester materials and especially those of the polyalkylene terephthalate type possessing excellent sublimiation, washing and light fastness properties.

3,578,389

FIBER REACTIVE PHOTOCHROMIC DYES

John Kazan, Jr., Somerville, and Walter Henry Foster, Jr., Freehold, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application Jan. 26, 1967, Ser. No. 611,840, now Patent No. 3,505,306, dated Apr. 7, 1970. Divided and this application June 3, 1969, Ser. No. 830,150

Int. Cl. D06p *1/10*

U.S. Cl. 8—163 **5 Claims**

Process of dyeing a textile material containing reactive hydrogen atoms, e.g., nylon, which comprises applying as dispersed dyes, fiber-reactive dye compounds comprising photochromic mercury dithizonates containing fiber-reactive groups to said textile material from an aqueous dispersion and subsequently fixing the dye with an alkali after-treatment. The dyed materials exhibit photochromic properties.

3,578,390

METHOD OF REMOVING SULFUR DIOXIDE FROM GASES CONTAINING THE SAME

Martin Kruel, Essen-Bergerhausen, Harald Juentgen, Essen-Heisingen, and Heinrich Drwatwa, Rheinhausen, Germany, assignors to Bergwerksverband GmbH, Essen, Germany

No Drawing. Continuation of application Ser. No. 739,902, June 13, 1968. This application May 27, 1969, Ser. No. 828,815

Claims priority, application Germany, Sept. 16, 1965, B 83,755

Int. Cl. B01d *47/00*

U.S. Cl. 23—2 **14 Claims**

Sulfur dioxide is removed from gases containing the same, particularly steam and oxygen-containing waste gas, by intimately contacting such gas and an adsorbent material consisting essentially of a porous carbonaceous material which is impregnated with an ammonium or alkali metal iodide or iodate. The contacting is carried out at an elevated temperature which may be up to 200° C. and preferably is at least as high as 100° C.

3,578,391

YTTRIUM PURIFICATION

Vincent Chiola, Joseph J. Cleveland, George J. Kamin, and Tai K. Kim, Towanda, Pa., assignors to Sylvania Electric Products Inc.

Filed Sept. 16, 1969, Ser. No. 858,341

Int. Cl. C22b *59/00;* **C01f** *17/00*

U.S. Cl. 23—22 **8 Claims**

A continuous process useful for the purification of yttrium from an aqueous solution containing light rare earths, heavy rare earths and yttrium comprising:

(a) an extraction step having a plurality of stages wherein an organic extractant solution consisting essentially of specific alkyl phosphoric acids in specific amounts, tributyl phosphates in specific amounts and a hydrocarbon solvent,

(b) a scrubbing step having a plurality of stages wherein the organic phase from the extraction step is scrubbed with an acidic aqueous scrub solution and the aqueous solution is thereafter recycled to the extractant step,

(c) a stripping step having a plurality of stages wherein the organic phase from the scrubbing step is stripped with an aqueous nitric acid solution to remove yttrium and the heavy rare earths from the organic phase,

(d) a washing step having a plurality of stages wherein the stripped organic phase is contacted with deionized water, and

(e) recycling the organic phase to the extraction step and processing the yttrium bearing aqueous solution to separate yttrium from the heavy rare earths.

3,578,392

MOLYBDENUM PURIFICATION PROCESS

Joseph E. Ritsko, Towanda, Pa., assignor to Sylvania Electric Products Inc.

No Drawing. Filed June 30, 1969, Ser. No. 837,940

Int. Cl. C22b *59/00;* **C01g** *39/00*

U.S. Cl. 23—22 **4 Claims**

The process, wherein an aqueous molybdenyl sulfate feed solution is formed from sulfuric acid and an impure molybdenum source and is contacted with an organic extractant phase to selectively extract molybdenum into the organic phase and thereafter the molybdenum values are recovered by using an aqueous ammonium stripping agent to contact the molybdenum-containing organic solution, is improved by adding the steps of (1) forming a molybdenyl sulfate solution containing a molybdenum concentration of from about 120 to about 180 grams/liter MoO_3 basis; (2) filtering the molybdenyl sulfate solution to remove undissolved impurities; (3) maintaining the temperature of the molybdenyl sulfate feed solution at from about 70° C. to about 90° C. for about 3 hours, thereby forming a high purity solid molybdenum trioxide and (4) separating the solid molybdenum trioxide from the aqueous feed solution that now has a reduced molybdenum concentration but is suitable as the aqueous feed solution to the organic extraction step.

3,578,393

PREPARATION OF CALCIUM HYPOCHLORITE FROM HYPOCHLOROUS ACID SOLUTIONS

John A. Wojtowicz, Cheshire, Conn., Milton Lapkin, Barrington, R.I., and Mohindar S. Puar, East Brunswick, N.J., assignors to Olin Corporation

No Drawing. Continuation-in-part of application Ser. No. 792,761, Jan. 21, 1969. This application Aug. 25, 1969, Ser. No. 852,895

Int. Cl. C01b *11/04, 11/06*

U.S. Cl. 23—86 **6 Claims**

Solutions of hypochlorous acid (HOCl), free from chloride, which are prepared by extraction of aqueous chlorination mixtures containing HOCl and chloride using an extraction solvent selected from the group consisting of lower alkyl ketones, lower alkyl cyanides and lower alkyl esters of lower alkanoic acids, are reacted with lime to produce a slurry of calcium hypochlorite in the solvent. The solid is separated from the solvent to obtain the calcium hypochlorite product in excellent yields of high quality material.

3,578,394

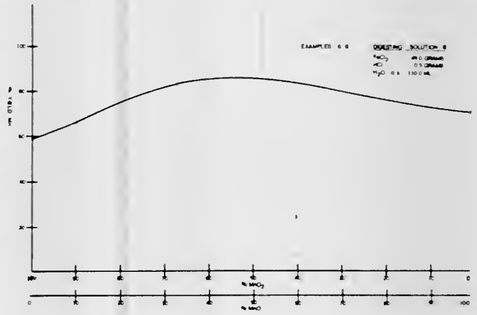
PREPARATION OF AQUEOUS MANGANOUS CHLORIDE SOLUTIONS

Jay W. Palmer, Crystal Lake, Ill., assignor to Morton International, Inc., Chicago, Ill.

Filed Dec. 5, 1969, Ser. No. 882,558

Int. Cl. C01g *45/06*

U.S. Cl. 23—87 **15 Claims**



A process for preparing aqueous solutions of manganous chloride essentially free from heavy metal contaminants by the reaction of manganese ore with an aqueous solution of ferrous chloride followed by removal of iron and heavy metals by treatment with sulfide ion. The manganous chloride solutions so prepared are suitable for further chemical processing or may be used to prepare pure manganese metal by electrolysis or other methods. Iron hydroxide may be recovered separately as a by-product of this process for use in pigments or as a raw material charge for the production of steel.

3,578,395

RECOVERY OF METALS

Harris E. Kluksdahl, San Rafael, and James R. Hopkins, Sonoma, Calif., assignors to Chevron Research Company, San Francisco, Calif.

No Drawing. Filed Dec. 26, 1967, Ser. No. 693,193

Int. Cl. C01g *49/00*

U.S. Cl. 23—20 **8 Claims**

A catalyst containing rhenium in the oxidized state supported on a porous solid carrier is treated with an excess of an ionic solution at a pH from 0–12 to recover rhenium from the catalyst without dissolving the carrier.

3,578,396

FLUIDIZED BED TREATMENT OF SPENT PULP DIGESTION LIQUOR

Robert J. Priestley, Westport, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

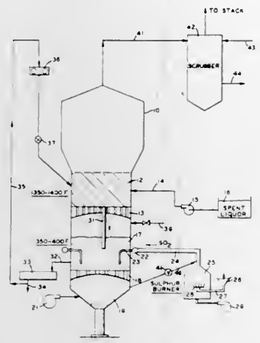
Filed Aug. 13, 1968, Ser. No. 752,334

Int. Cl. D21c *11/12*

U.S. Cl. 23—48 **7 Claims**

The reclaiming of chemicals from spent wood pulp digestion liquors by reacting the liquor in a thermal oxidizing, fluidized bed, then feeding the product to a fluidized cooling bed, SO_2 from a sulfur burner being fed di-

rectly into the cooling bed and thence to the oxidizing bed to form additional sulphate material, without formation



of objectionable SO_3 and scale formation which tends to result from introducing hot SO_2 into the hot bed.

3,578,397
PREPARATION OF ANHYDROUS CUPROUS CHLORIDE OR BROMIDE
Harold E. Doorenbos, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Nov. 26, 1969, Ser. No. 880,423
Int. Cl. C01g *3/04*
U.S. Cl. 23—97 **2 Claims**

Essentially anhydrous cuprous chloride or bromide is prepared by reacting cupric chloride or bromide with an alkyl hydrogen phosphonate.

3,578,398
SYNTHETIC CRYSTALLINE ZEOLITE AND PREPARATION THEREOF
Edwin Earl Jenkins, Elmer, N.J., assignor to Mobil Oil Corporation
No Drawing. Filed Apr. 1, 1968, Ser. No. 717,978
Int. Cl. C01b *33/28*
U.S. Cl. 23—113 **19 Claims**

As a new zeolite, a crystalline aluminosilicate having a definite repetitive crystalline structure similar to offretite and containing tetramethylammonium ions. It is prepared from a mixture of silica, alumina, water, sodium oxide, potassium oxide, and tetramethylammonium oxide. Hydrocarbon conversion utilizing a catalyst comprising the new zeolite.

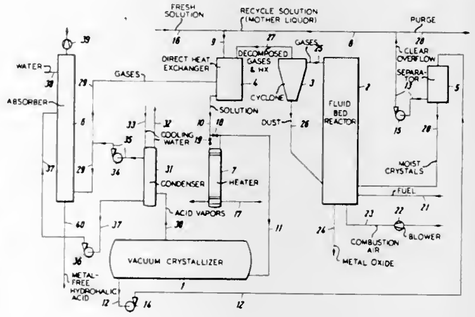
3,578,399
PRODUCTION OF CRYSTALLINE POTASSIUM SULFATE
Albert F. Boeglin, Carlsbad, N. Mex., assignor to International Minerals & Chemicals Corporation
No Drawing. Filed Oct. 23, 1968, Ser. No. 770,069
Int. Cl. C01d *5/10*
U.S. Cl. 23—121 **7 Claims**

The metathetical reaction of langbeinite with potassium chloride to produce crystalline potassium sulfate proceeds slowly and with considerable foaming when a small amount of surface active agent has been added for the purpose of increasing the average size of the potassium sulfate crystals. The reaction can be made to proceed to completion more quickly and foaming can be controlled by adjusting the pH of the reaction mixture at a time when the reaction has proceeded about 35% to about 50% to completion. The pH is adjusted from an initial value of about 7 to a value between 2 and 6 by addition of acid.

3,578,400
PREPARATION OF CHLORIDE-FREE HYPOCHLOROUS ACID SOLUTIONS
John A. Wojtowicz, Cheshire, Milton Lapkin, Woodbridge, and Mohindar S. Puar, Hamden, Conn., assignors to Olin Corporation
No Drawing. Filed Jan. 21, 1969, Ser. No. 792,761
Int. Cl. C01b *11/04*
U.S. Cl. 23—152 **8 Claims**

Solutions of hypochlorous acid (HOCl), free from chloride and chlorine are prepared by extraction of aqueous chlorination mixtures containing HOCl and chloride using an extraction solvent selected from the group consisting of lower alkyl ketones, lower alkyl cyanides and lower alkyl esters of lower alkanoic acids. The lower alkyl suitably contains 1 to 5 carbon atoms and the lower alkanoic acids suitably contain 1 to 5 carbon atoms. The resulting solutions, containing from about 0.5 to about 50 percent by weight of HOCl, are useful for chlorohydrination reactions where the presence of chloride or chlorine is deleterious.

3,578,401
PROCESS OF PRODUCING HYDROHALIC ACIDS AND METAL OXIDES
Dieter Ueberle and Ernst Heinz, Frankfurt am Main, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany
Filed Jan. 29, 1969, Ser. No. 794,964
Claims priority, application Germany, Jan. 31, 1968, P 16 67 195.7
Int. Cl. C01b *7/00, 7/08*
U.S. Cl. 23—154 **13 Claims**



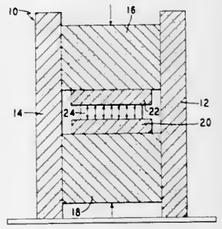
A process of producing hydrohalic acid and metal oxide from a metal halide solution, wherein metal halide is precipitating from the metal halide solution in a precipitation step, and the precipitated halide is separated from the mother liquor and is thermally decomposed with oxygen, steam or a mixture thereof, to yield a hot hydrohalic acid containing gas and metal oxide, characterized in that:

(a) mother liquid is recycled to the precipitation step,
(b) said recycle mother liquor, prior to the precipitation step being subjected to direct heat exchange with said hot hydrohalic acid-containing gas,
(c) the mother liquor recycle stream is recycled so often that the throughput of recycle mother liquor per unit of time amounts to 4 to 20 times the amount of metal halide solution which is fed to the process per unit of time.

3,578,402
METHOD FOR INHIBITING THE FOAMING TENDENCIES OF PHOSPHORIC ACID
Olen L. Riggs, Jr., Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
No Drawing. Filed Feb. 9, 1968, Ser. No. 704,215
Int. Cl. C01b *25/18*
U.S. Cl. 23—165 **2 Claims**

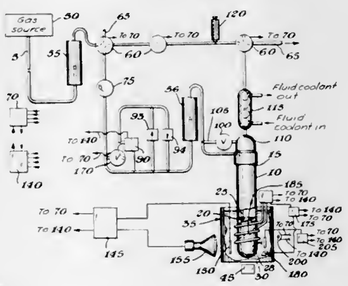
The foaming tendencies of phosphoric acid are inhibited by addition thereto of the reaction product of an iodide such as hydrogen iodide and an organic amine such as aliphaticalkyl mono and diamines, imidazolines, and guanidines.

3,578,403
RECRYSTALLIZATION OF PYROLYTIC BORON NITRIDE
Arthur W. Moore, Parma, Ohio, assignor to Union Carbide Corporation
Filed July 5, 1968, Ser. No. 742,614
Int. Cl. C01b *21/06*
U.S. Cl. 23—191 **6 Claims**



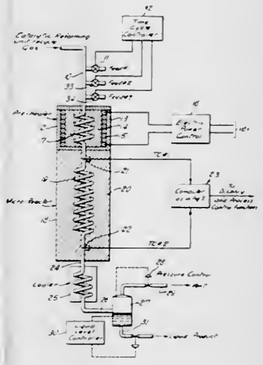
A method for structurally transforming pyrolytic boron nitride into a product closely related to a single crystal hexagonal boron nitride structure by subjecting a disc or plate of the starting material to a simultaneous temperature of at least 2250° C. and pressure of 5000 p.s.i. in a non-reactive atmosphere. The pressure is applied uniaxially in the predominant direction of the C-axes and applied so as to place the material in compression.

3,578,404
AUTOMATIC REACTION RATE APPARATUS
Wilhelm E. Walles, Midland, Mich., and William F. Tousignant, Elm Grove, Wis., assignors to The Dow Chemical Company, Midland, Mich.
Filed Dec. 4, 1967, Ser. No. 687,707
Int. Cl. G01n *7/02, 7/18*
U.S. Cl. 23—230 **25 Claims**



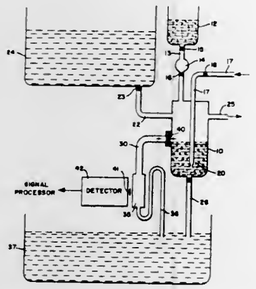
Method and apparatus for ascertaining the rate of reaction that evolves or consumes a gas; comprising a closed, circuitous duct a first upstream end of which originates at a downstream portion of a reaction vessel, proceeds through valve means, pump means, and pressure sensing means, means for sensing at least one kind of influence upon the rate of a reaction in said reaction vessel, and optionally other means, returning to terminate at a second, downstream end at an upstream portion of said reaction vessel which, in turn, communicates with said first end. By control under provided timing means, confined gas pressure is sensed in increments, along with increments of reaction-rate influences such as heat; during operation the interior of the duct and vessel are returned to reference pressure after each sensing increment and are subject to substantially continuous movement of gas.

3,578,405
METHOD AND APPARATUS FOR ANALYSIS OF FLUID MIXTURES
Robert A. Woodle, Nederland, Tex., assignor to Texaco Inc., New York, N.Y.
Filed July 22, 1968, Ser. No. 746,488
Int. Cl. G06f *15/46;* **G01n** *25/00*
U.S. Cl. 23—230 **16 Claims**



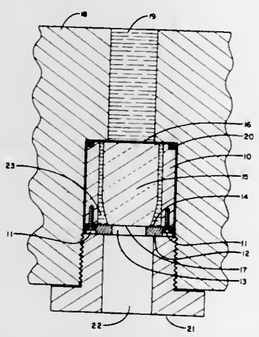
A method and apparatus for continuously monitoring a component of a fluid mixture, such as the naphthene content of a hydrocarbon mixture. The apparatus includes an adiabatic selective micro-reactor, such as a dehydrogenation micro-reactor, in which the fluid mixture is reacted to alter a component by conversion to another chemical component having different physical properties such as the heat of formation thereof, and means for sensing the altered physical property such as thermocouples, thereby enabling detection of the fluid component of interest in accordance with the altered physical property. In a further embodiment a unique computer is provided for calculating the concentration in the mixture of the fluid component of interest in response to the sensed heat of the reaction. The method of the invention includes reacting the fluid mixture to alter at least one component of the fluid mixture to a different chemical component having a different physical property thereby rendering the altered fluid component distinguishable, and detecting the fluid component of interest. In one aspect of the method the detecting step includes the steps of sensing the heat of the reaction by sensing the fluid temperature before and after the reaction, and generating signals corresponding to the sensed temperatures, and in response to these signals generating a further signal corresponding to the concentration in the mixture of the fluid component of interest in accordance with a predetermined relationship between the heat of said reaction and said concentration.

3,578,406
SULFUR DIOXIDE MEASUREMENT SYSTEM
Boong Y. Cho and Larry B. Anderson, Columbus, Ohio, assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed Mar. 3, 1969, Ser. No. 803,642
Int. Cl. G01n *23/00*
U.S. Cl. 23—232 **10 Claims**



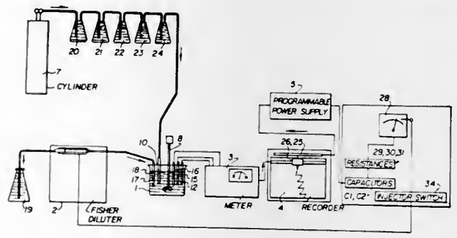
A quantitative determination of relatively small or trace amounts of gaseous sulfur dioxide involves a reaction between mercurous chloride and sulfurous acid, the latter formed when sulfur dioxide is dissolved in water. One of the reaction products is a water soluble bis-sulfitomercurate complex, the mercurate being easily removable from the remainder of the reaction mixture. The conversion of sulfur dioxide to the bis-sulfitomercurate complex is about 95% complete. By nucleonically detecting the amount of the bis-sulfitomercurate complex, which contains a metal having a high Z number (atomic number), using a monoenergetic source of nuclear radiation in the range of 15 to 25 kev., the amount of the complex is determinable and easily compared against a known standard sample either electronically or visually. The present system may be used on a continuously flowing gas such as stack gas, in which event it is unnecessary to scrub the gas, and permitting accurate determination of trace amounts of sulfur dioxide by monitoring or controlling the gas flow rate.

3,578,407
HIGH-PRESSURE CLOSURE APPARATUS
Lloyd C. Arnold, Texas City, and George A. Mortimer, La Marque, Tex., assignors to Monsanto Company, St. Louis, Mo.
Filed Oct. 14, 1968, Ser. No. 767,079
Int. Cl. B65d *25/54;* **G01f** *23/02*
U.S. Cl. 23—252 **12 Claims**



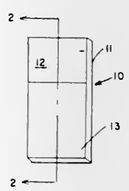
An apparatus for use in high pressure applications comprising a solid body having a partially ellipsoidal shape, said solid body being of a material having high compressive strength and low tensile strength and a means for uniformly supporting said body. The apparatus is especially suitable as a window and a support for said window which can be mounted in a reaction vessel for visual observation of very high pressure chemical reactions.

3,578,408
TITRATING APPARATUS
Louis L. Sirois, Albert A. Winer, and Gordon E. Alexander, Ottawa, Ontario, and Arthur P. Page, Stittsville, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada
Filed Oct. 7, 1969, Ser. No. 864,488
Int. Cl. G01n *27/56, 31/16;* **G01r** *5/28*
U.S. Cl. 23—253 **6 Claims**



An automated potentiometric titrating apparatus for successively adding quantities of titrant to a mineral suspension when the pH recovery is at equilibrium, comprising electrodes in the suspension and connected to a pH meter and strip chart recorder, a meter relay for operating a titrant adding device, a capacitor for operating the meter relay, a programmable power supply for charging the capacitor, a variable resistance coupled to the recording pen of the strip chart recorder for operating the programmable power supply in response to changes in the pH of the suspension, and a motor driven cam operated microswitch assembly, for controlling the quantities of titrant added and the response of the meter relay, so that it is responsive to the systems indicating pH recovery of suspension.

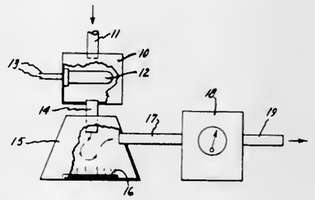
3,578,409
SENSORS UNAFFECTED BY HUMIDITY CHANGES TO DETECT TOXIC OXIDIZING VAPORS
Herbert P. Silverman, Orange, and Gino A. Giarrusso, Long Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed Aug. 23, 1967, Ser. No. 662,663
Int. Cl. G01n *31/00, 31/06*
U.S. Cl. 23—254 **5 Claims**



A thin film of a metal such as iron, silver or copper being oxidizable to the extent of corrosion bonded to a non-corrodible backing and having a thin layer of a compound such as potassium chloride on at least a portion of the metal, the compound being adapted to prevent the formation of a passivating layer on the metal when exposed to oxidizing vapors and being adapted to permit

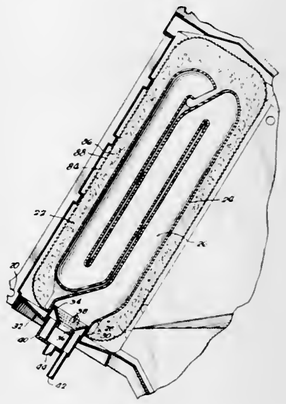
continued oxidation of the metal; and an additive to said compound of a hygroscopic organic composition such as glycerol having been mixed with the compound in solution before coating the metal therewith.

3,578,410
AMMONIA DETECTION, FOLLOWING ULTRAVIOLET RADIATION
Frank W. Van Luik, Jr., Schenectady, N.Y., assignor to General Electric Company
Filed July 1, 1968, Ser. No. 741,529
Int. Cl. G01n *21/26, 33/00;* **H01j** *37/00*
U.S. Cl. 23—232 **4 Claims**



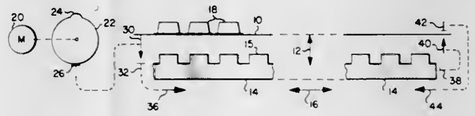
If a gas such as air containing small amounts of ammonia is exposed to ultraviolet radiation prior to being contacted with an acid to form ammonia compound condensation nuclei, about 1000 times more nuclei are formed than if such radiation is omitted.

3,578,411
BUBBLER ASSEMBLY FOR BLOOD TREATING APPARATUS
Donald J. Bentley, Newport Beach, Calif., and Richard A. De Wall, Dayton, Ohio; said De Wall assignor to Bentley Laboratories, Inc., Santa Ana, Calif.
Filed July 22, 1969, Ser. No. 843,558
Int. Cl. A61m *1/03*
U.S. Cl. 23—258.5 **11 Claims**



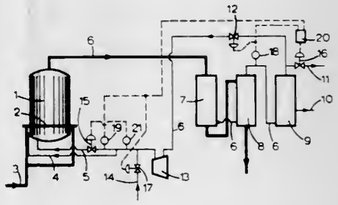
A bubbler assembly for use in a blood treating apparatus such as a blood oxygenator for forming films of blood in bubble form by directing oxygen into a stream of venous blood to effectuate transfer of oxygen to the blood film and release of carbon dioxide from the blood film. The bubbler assembly is characterized by an improved arrangement of the blood passageway which is generally S-shaped in nature; by a completely smooth interior which eliminates sharp edges; by an improved outlet structure whereby blood bubbles empty outwardly and downwardly on a deflector plate for more uniform distribution of blood through an enveloping defoamer unit; and by an improved exterior configuration having recessed side portions relative to adjacent top and bottom structure by means of which a greater portion of the defoamer sleeve is held relatively spaced from the bubbler structure to eliminate obstructions to the flow of bubbles passing out of the bubbler unit and to expose a greater area of the defoamer sleeve to the blood.

3,578,412
AUTOMATED TRANSPORT SYSTEM
Donald N. Martin, Whittier, Calif., assignor to Beckman Instruments, Inc.
Filed Jan. 22, 1968, Ser. No. 699,617
Int. Cl. G01n *1/10;* **B65g** *47/00*
U.S. Cl. 23—259 **15 Claims**



A transport system for use in an automated chemical analyzer having a pair of horizontal rails on which a plurality of individual sample capsules are adapted to be supporter and conveyed by means of a pair of serrated members or racks, in intermittent stop and go fashion, past a series of processing stations where various analytical steps are performed, the rails being mounted for up and down movement by means of a vertical air cylinder, the racks being mounted for reciprocal horizontal movement by a horizontal air cylinder, the action of rails and racks being synchronized or coordinated so that a capsule on the rails in the down position thereof is disposed in engagement with a pair of teeth on the racks which then slides the capsule along the rails a distance equal to about the width of a capsule, after which the vertical air cylinder is triggered to raise the rails and trigger return of the racks, each cycled downward movement of the rails engaging the capsule with the next downstream pair of teeth of the racks during each succeeding cycle and in such manner conveying the capsule the length of the rails.

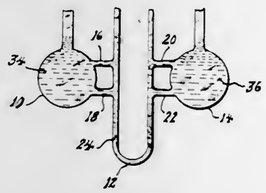
3,578,413
APPARATUS FOR THE PRODUCTION OF MELAMINE FROM UREA
Victor A. M. G. Vorage, Beek, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands
Filed Nov. 21, 1968, Ser. No. 777,705
Claims priority, application Netherlands, Nov. 21, 1967, 6715751
Int. Cl. B01j *9/20;* **C07d** *55/28*
U.S. Cl. 23—260 **2 Claims**



Apparatus for producing melamine from urea which includes in combination a reactor and separating devices in communication therewith for removing melamine from

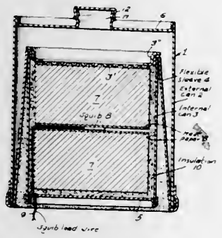
the reaction product and recovering NH_3 from the essentially melamine-free reaction product. The recovered NH_3 is recycled to the reactor to fluidize the catalyst bed therein and to atomize the urea fed thereto for conversion into melamine. Venting conduit means and supplemental ammonia conduit means are also provided. Means for sensing the pressure in the reactor and separating devices and for sensing the amount of ammonia introduced into the reactor to fluidize the catalyst bed are employed and in response to the sensed pressure and quantity values. The pressure and amount of ammonia utilized are controlled to maintain the reactor in operational condition.

3,578,414
APPARATUS FOR GROWTH OF LARGE CRYSTALS IN GELS
Alton F. Armington, Lexington, and John J. O'Connor, Arlington, Mass., assignors to the United States of America as represented by the Secretary of the Air Force
Filed Oct. 24, 1967, Ser. No. 677,791
Int. Cl. B01d *9/02*
U.S. Cl. 23—273 **3 Claims**



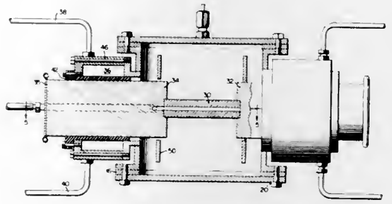
An apparatus for growing single crystals of a relatively large size having first and second reactant containing reservoirs respectively possessing relatively large volumes in relation to the volume of a crystal growing chamber positioned in a horizontal relationship between the reservoirs and interconnected thereto. Crystal growth is effected in a gel matrix positioned within the crystal growing chamber with the first and second reservoirs containing the required crystal growing solutions needed to bring about crystal growth.

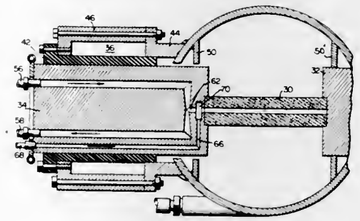
3,578,415
DRY HYDROGEN GENERATOR
Ralph H. Hiltz, Pittsburgh, Pa., assignor to the United States of America as represented by the Secretary of the Army
Continuation-in-part of application Ser. No. 681,965, Nov. 8, 1967. This application Oct. 13, 1969, Ser. No. 865,712
Int. Cl. B01j *7/00*
U.S. Cl. 23—281 **2 Claims**



A telescopically expandable container for dry materials which produce hydrogen when heated by a squib or other means. The expandable container allows for cooling of the liberated gas and removal of moisture therefrom.

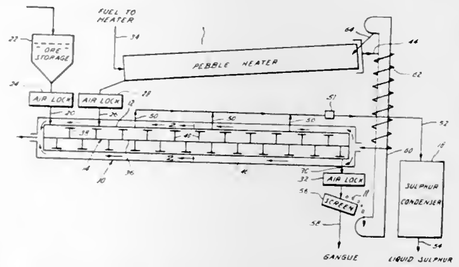
3,578,416
HIGH TEMPERATURE REACTOR
Bill J. Pope, Department of Chemical Engineering, Brigham Young University, Provo, Utah 48601
Filed Dec. 19, 1968, Ser. No. 785,156
Int. Cl. F27d *11/04*
U.S. Cl. 23—277 **3 Claims**





A high temperature gas reactor is provided for carrying out high temperature chemical reactions. The reactor includes a porous member, having electrical resistance properties, mounted in a gas introduction chamber. A first gas is introduced into the chamber and is heated as it passes through the porous member. A second gas communicates with the heated first gas at a Venturi passage which Venturi passage is adapted to draw the heated first gas from the gas introduction chamber through the porous member. In an embodiment, an auxiliary reaction chamber is positioned between the porous member and the Venturi passage and a third gas is supplied to said auxiliary chamber.

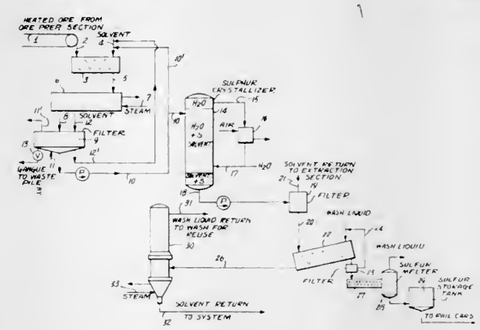
3,578,417
VAPORIZING SULFUR FROM ORE BY DIRECT CONTACT WITH HEATED PEBBLES
John M. Dale, San Antonio, Tex., assignor to Pan American Sulphur Company, Houston, Tex.
Filed June 30, 1969, Ser. No. 837,655
Int. Cl. B01d *7/00;* **C01b** *17/08*
U.S. Cl. 23—294 **11 Claims**



The continuous method of and apparatus for recovering sulfur from ores by feeding surface sulfur ore into a closed conveyor and simultaneously heating the ore with

heated pebbles while slowly mixing and conveying the mixture through the conveyor and heating the ore above the boiling point of sulfur to vaporize the sulfur in which the vaporized sulfur is passed through a condenser for recovery. The depleted ore and pebbles are discharged from the conveyor and separated with the pebbles being conveyed to a heater for reheating and reuse. For greater efficiency the hot exhaust gases from the pebble heater are flowed in a counterflow heat exchange relationship with the container to heat the mixture. The conveyor having an elongate power shaft positioned longitudinally in the container for rotative movement with a plurality of paddles positioned adjacent the interior walls of the container and connected by the shaft for rotative movement to mix the ore and pebbles, move the mixture along the conveyor, and keep the interior walls of the container cleaned for greater heat transfer. The volume of pebbles being greater than the volume of ore in the container to more easily convey the mixture through the conveyor.

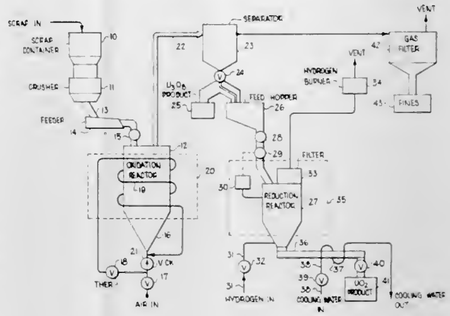
3,578,418
SULFUR EXTRACTION USING HALOGENATED HYDROCARBONS INCLUDING WASHING THE RECOVERED SULFUR WITH METHANOL, ACETONE, OR ETHYLENE GLYCOL
Robert R. Cantrell, Baltimore, and Vernon F. Swanson, Ellicott City, Md., assignors to W. R. Grace & Co., New York, N.Y.
Filed May 27, 1968, Ser. No. 732,294
Int. Cl. C01b *17/08, 17/14;* **B01d** *9/02*
U.S. Cl. 23—299 **11 Claims**



A solvent-extraction process for recovering sulfur from sulfur-bearing ores not amenable to treatment by the Frasch hot-water process. Sulfur-bearing ore is dried and contacted with a solvent, such as tetrachloroethylene, at a temperature above the melting of the sulfur. The gangue is separated from the loaded solvent by filtration, and the loaded solvent is cooled to a temperature to permit crystallization of the sulfur. The solid sulfur is separated from the solvent and the sulfur cake is passed through a countercurrent washing system to remove residual solvent and to provide sulfur in essentially pure form.

3,578,419
SCRAP NUCLEAR FUEL MATERIAL RECOVERY PROCESS
Richard K. Welty, Murrysville, Pa., assignor to General Electric Company
Filed Dec. 14, 1967, Ser. No. 690,635
Int. Cl. C01g *1/02, 43/02*
U.S. Cl. 23—317 **4 Claims**

An improved process for recovering hard scrap nuclear reactor fuel material is disclosed. In the preparation of fuel pellets, a significant quantity of scrap nuclear fuel material which has been pressed and sintered is produced. In the disclosed process, the scrap is first oxidized in a fluidized bed method which simultaneously oxidizes and comminutes the scrap, then, if desired, the oxidized material is reduced back to the original chemical form with improved sinterability.



3,578,420
METAL FILM RESISTOR
Yasuro Nishimura, Machida-shi, and Masao Tanaka, Tokyo, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed Sept. 20, 1968, Ser. No. 761,050
Claims priority, application Japan, Sept. 23, 1967, 42/61,093
Int. Cl. B32b *15/04;* **H01c** *7/00*
U.S. Cl. 29—195 **2 Claims**

Our invention relates to a metal film resistor comprising evaporated thin films of small specific resistance and temperature coefficient of resistance. The metal film resistor comprises a first evaporated thin film including nickel, chromium and gold and, when necessary, other metals and an electrically stable second evaporated thin film provided on said first evaporated thin film. The second film prevents diffusion and precipitation of gold in the first evaporated thin film and protects the first evaporated thin film.

3,578,421
LIQUID HYDROCARBON COMPOSITIONS CONTAINING REACTION PRODUCTS OF AN AMINE AND METHYL VINYL ETHER-MALEIC ANHYDRIDE COPOLYMERS AS ANTI-STATIC AGENTS
Harry J. Andress, Jr., Pitman, and Henry Ashjian, East Brunswick, N.J., assignors to Mobil Oil Corporation
No Drawing. Filed July 26, 1968, Ser. No. 747,808
Int. Cl. C10l *1/18, 1/22*
U.S. Cl. 44—62 **17 Claims**

Liquid hydrocarbon compositions are provided containing, in an amount sufficient to impart anti-static properties, the reaction product of an amine and a methyl vinyl ether-maleic anhydride copolymer.

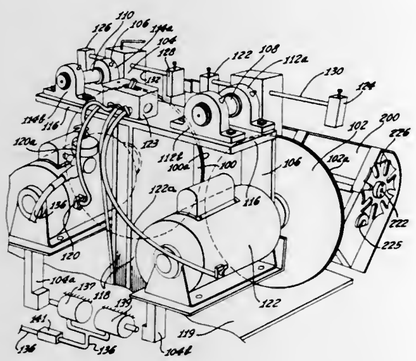
3,578,422
EMULSION RESISTANT FUEL COMPOSITIONS
Casper John Dorer, Jr., Lyndhurst, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio
No Drawing. Filed Mar. 3, 1969, Ser. No. 804,015
Int. Cl. C10l *1/18, 1/22*
U.S. Cl. 44—63 **14 Claims**

Fuel compositions containing additive combinations consisting of at least (1) one ashless dispersant, (2) an ammonium or amine salt of sulfonic acid, and (3) an oil-soluble polyether. A typical fuel could contain at least one acylated nitrogen material prepared by reacting a hydrocarbon substituted succinic acid anhydride and an ethylene polyamine, at least one ammonium salt of a petrosulfonic acid, and a polyglycol.

3,578,423
PROCESS FOR CATALYTICALLY SPLITTING ISOBUTYRALDEHYDE TO PRODUCE CARBON MONOXIDE AND HYDROGEN
Jurgen Falbe, Dinslaken, and Heinz-Dieter Hahn, Oberhausen-Sterkrade-Nord, Germany, assignors to Ruhrchemie A.G.
No Drawing. Filed Apr. 14, 1969, Ser. No. 816,108
Claims priority, application Germany, Apr. 20, 1968, P 17 67 281.0
Int. Cl. C01b *2/14*
U.S. Cl. 48—197 **11 Claims**

Process for catalytically splitting isobutyraldehyde with formation of a gas mixture consisting essentially in carbon monoxide and hydrogen which comprises contacting isobutyraldehyde and water vapor in amount of at least 3 moles water vapor per g-atom aldehyde carbon, at temperatures of about 600–900° C. at ordinary atmospheric or elevated pressure, with a nickel containing catalyst.

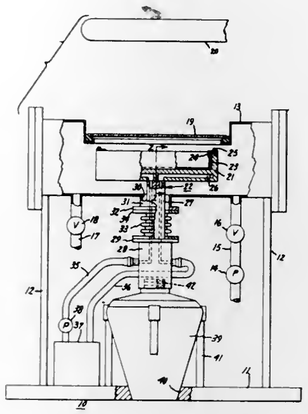
3,578,424
ABRADING MACHINE FOR A PREFORMED ORTHODONTIC BAND
Frank R. Miller, Bradbury, and Raymond E. Dillberg, Temple City, Calif., assignors to Ormco Corporation, Glendora, Calif.
Filed Aug. 9, 1968, Ser. No. 751,555
Int. Cl. B24b *5/00*
U.S. Cl. 51—89 **5 Claims**



A machine for forming an orthodontic incisor, cuspid, bicuspid or molar band is provided. The machine is provided with opposed peripheral abrading wheels which are pendantly supported with drive motors on the lower ends of the pendant arms and a conveyor means moves the bands into grinding position.

3,578,425
DIAMOND AND BORON NITRIDE PARTICLES COATED WITH A POLYMERIZED DIANHYDRIDE
Archibald N. Wright, Schenectady, N.Y., and Wilfred F. Mathewson, Jr., Franklin, Mich., assignors to General Electric Company
Filed Mar. 14, 1967, Ser. No. 622,944
Int. Cl. B24b *1/00;* **C08** *51/12*
U.S. Cl. 51—295 **4 Claims**

A thin, continuous film is formed on a substrate by ultraviolet surface photopolymerization of a material in the gaseous phase. The material is selected from various anhydrides and dianhydrides. Such films, which can be selectively formed as electrically insulating or electrically conductive, are useful as coatings on metallic and nonmetallic substrates, and for corrosion protection. The electrically insulating films are useful further as capacitor dielectrics, cryogenic device insulation, insulation for microelectric devices, and primer or insulation on electri-

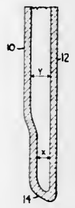


cally conductive wire, while the electrically conductive films can also be employed as conductive layers in microelectric devices.

3,578,426
METHOD FOR MAKING GLASS FIBER STRAND FOR RESIN REINFORCEMENT
Thomas E. Philipps, Granville, and James C. Belue, Sylvania, Ohio, assignors to Owens-Corning Fiberglas Corporation
Continuation-in-part of application Ser. No. 493,505, Oct. 6, 1965. This application Jan. 8, 1968, Ser. No. 696,172
The portion of the term of the patent subsequent to Mar. 3, 1987, has been disclaimed
Int. Cl. C03c *25/02, 25/06*
U.S. Cl. 65—3 **11 Claims**

Bundles of glass fibers and method of producing same wherein the fibers are etched and are held together along generally line contacts by a brittle binder formed by the deposition in situ of the material leached from the fibers.

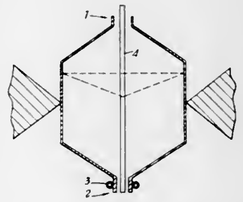
3,578,427
PROCESS FOR FABRICATING GLASS MULTIPLE GLAZED UNITS
Robert A. Jansson, Pittsburgh, and Raymond J. Mickelic, Springdale, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Dec. 16, 1968, Ser. No. 784,130
Int. Cl. C03b *23/24*
U.S. Cl. 65—58 **10 Claims**



A process for the manufacture of welded all-glass multiple glazed window units having a stepped edge configuration such that the spacing of the glass sheets about the marginal edges of the unit is less than the spacing of the glass sheets throughout the remainder of the unit. A multiple glazed unit is heated inwardly of the marginal

fused edge of one of its glass sheets, and then the portion of the glass sheet within the heated circumscribing portion is moved relative to the other glass sheet.

3,578,428
METHODS OF PRODUCING CERAMIC MATERIAL IN ROD OR TUBE FORM
William Stanley Lee, South Shields, England, assignor to James A. Jobling & Company Limited, Sunderland, England
Filed Nov. 4, 1968, Ser. No. 773,108
Int. Cl. C03c *17/00;* **C03b** *5/22*
U.S. Cl. 65—60 **3 Claims**



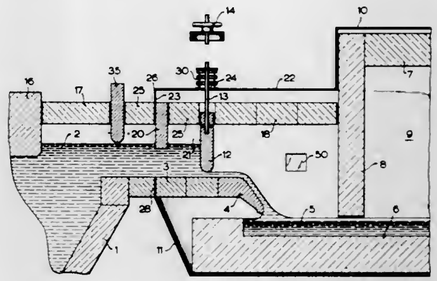
A method of producing ceramic material in rod or tube form comprising the steps of feeding lengths of ceramic material of specific desired composition to a melting chamber, melting the lengths of ceramic material in the chamber and continuously drawing ceramic material of rod or tube form from the chamber.

3,578,429
APPARATUS FOR MAKING MINIATURE INCANDESCENT LAMPS
Donald J. Belknap, 302 Patterson Court, Takoma Park, Md. 20012
Filed Sept. 19, 1968, Ser. No. 760,852
Int. Cl. C03c *27/02;* **H01j** *9/00*
U.S. Cl. 65—154 **17 Claims**

Miniature incandescent lamp envelopes are formed seriatim by feeding the components by gravity-feed chutes to an assembly station where the envelope sleeves are supported on a table having aligned grooves for receiving the sleeves. The end sleeves are partially inserted into the central sleeve by pusher members. The resulting assemblies are then conveyed by a rotating member to a sealing station. Filaments are formed and inserted into the envelopes by pulling a length of wire through a tubular sleeve, inserting an envelope over the sleeve and winding a filament coil from the end of the filament wire projecting from the sleeve. The coil winder comprises a mandrel about which the coil is formed, and a wire guide for engaging the wire at locations spaced laterally from the mandrel. A solenoid is supported for rotation about the axis of the mandrel. The solenoid has two jaws which grip the wire. Both the jaws and the mandrel are rotated with the solenoid. The mandrel is also mounted for axial reciprocation.

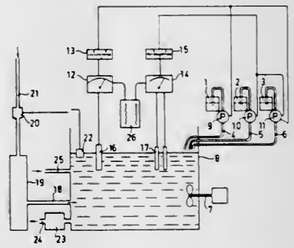
3,578,430
SEALED FLOAT GLASS PLANTS
Günter Labrot, Porz, Germany, assignor to Erste Deutsche Floatglas G.m.b.H. & Co. OHG., Porz, Cologne, Germany
Filed Mar. 27, 1968, Ser. No. 716,483
Claims priority, application Germany, Mar. 29, 1967, E 33,696
Int. Cl. C03b *18/02*
U.S. Cl. 65—157 **9 Claims**

The specification describes means for preventing the access of air to molten glass passing from a container or source thereof to a chamber having a bath of molten tin therein, on which the molten glass is floated to produce a glass sheet including a plurality of weirs, at least



one of which is of a gas-impervious nature, and a masonry channel having gas-impervious external sheathing structure.

3,578,431
METHOD FOR AUTOMATICALLY SUPPLYING NUTRITIVE COMPOSITIONS TO PLANTS IN OPTIMUM AMOUNTS
Nils Torsten Ingestad, Stockholm, and Ernst Göran von Haartman, Lund, Sweden, assignors to Aktiebolaget Wallco, Stockholm, Sweden
Filed Sept. 30, 1966, Ser. No. 583,163
Claims priority, application Sweden, Oct. 1, 1965, 12,722
Int. Cl. A01g *9/00, 31/00*
U.S. Cl. 71—1 **4 Claims**

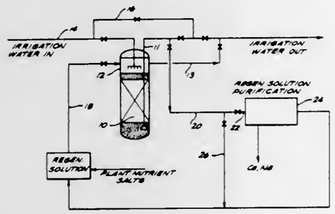


Constant nutrient composition corresponding to predetermined nutrient proportions at optimum growth is automatically maintained in an aqueous cultivation medium for plants without the need for replacing the medium with a fresh solution. Mineral nutriment is supplied to the cultivation medium consisting essentially of water and a nutrient salt mixture in response to variations in hydrogen ion concentration and conductivity from at least three nutrient solutions, the first solution being alkaline and containing a portion of the nutrients, the second solution being acidic and containing a second portion of the nutrients, and the third solution containing the remainder of the nutrients.

3,578,432
METHOD OF IRRIGATION
Vernon E. Stiles, 1012 Brookdale Place, Fullerton, Calif.
Filed Mar. 22, 1968, Ser. No. 715,208
Int. Cl. A01g *25/00*
U.S. Cl. 71—1 **19 Claims**

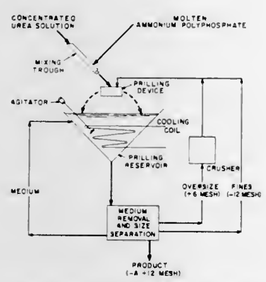
Irrigation water is contacted with ion exchange resins charged with ions of plant nutrients, e.g., ammonium, nitrate, sulfate, potassium, to replace the ions of the salts

contained in the irrigation water with ions of nutrient value. This treatment obviates the difficulties encountered in arid and semi-arid areas with irrigation water containing a high content of dissolved salts which otherwise tend to accumulate in the soil to phytotoxic levels. In a typical embodiment, a column of mixed anion and cation exchange resins charged with nitrate and ammonium, respectively, and having a size of about 1.5 feet in diameter and about 10 feet in length is used to treat irrigation water having a total of about 300 p.p.m. hardness at a



liquid hourly space velocity of about 50 liquid volumes per volume per hour. This bed within a four-hour period treats a sufficient quantity of water to irrigate one acre one inch in depth and results in the addition of about 210 parts per million of ammonium nitrate to the irrigation water. When this is practiced over a year's irrigation involving approximately 3 acre feet of water per acre of irrigated land, the amount of nitrogen supplied is from about 400 to 850 pounds nitrogen, ample to supply all of the nutrient requirements of the plants.

3,578,433
METHOD FOR UREA-AMMONIUM POLYPHOSPHATE PRODUCTION
Gabriele A. Bottai, Florence, and John M. Stinson, Sheffield, Ala., assignors to Tennessee Valley Authority
Filed Aug. 5, 1968, Ser. No. 750,277
Int. Cl. C05b *1/00*
U.S. Cl. 71—1 **7 Claims**



PRODUCTION OF UREA-AMMONIUM POLYPHOSPHATES BY PRILLING IN LIQUID MEDIUM

Prilling processes for the production of high-analysis fertilizers composed of urea and ammonium polyphosphate which involve combining concentrated urea solution with molten ammonium polyphosphate, forming droplets of said mixtures, and solidifying said droplets by allowing them to fall through liquid medium. Alternatively, product fines and crushed oversize or supplemental fertilizer materials such as potassium chloride or micronutrient sources may be incorporated prior to droplet formation.

3,578,434
2,6-DICYANOTRICHLOROPYRIDINE SEED TREATMENT
Robert L. Noeroske, Walnut Creek, and Helen K. Tobol, Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed July 23, 1968, Ser. No. 746,730
Int. Cl. A01c *1/06;* **A01n** *21/02*
U.S. Cl. 71—77 **2 Claims**

Compositions containing 2,6-dicyanotrichloropyridine are applied to seeds to enhance and accelerate growth of the plant and to protect the seeds from pesticidal attack.

3,578,435
METHOD FOR PROMOTING GROWTH OF AGRICULTURAL PLANT
Tsunezo Ushioda, Tokyo, and Katsuhiko Nonaka, Minoru Yasuhara, Katsuya Sato, Takeshi Inoi, and Hiroaki Ishibashi, Yokohama-shi, Kanagawa-ken, Japan, assignors to Chisso Corporation, Osaka, Japan
No Drawing. Filed Dec. 29, 1966, Ser. No. 605,541
Claims priority, application Japan, Jan. 27, 1966, 41/4,732; Mar. 26, 1966, 41/18,595; Nov. 17, 1966, 41/75,715
Int. Cl. A01n *9/22*
U.S. Cl. 71—92 **7 Claims**

A method for promoting the growth of agricultural plant by contacting said plant with 2-oxo-4-methyl-6-ureido-hexahydropyrimidine (which is a condensation product of urea and acetaldehyde or crotonaldehyde) and/or 2-oxo-4-methyl-6-hydroxy-hexahydropyrimidine (which is a hydrolyzate of the former), especially in soilless culture or in foliage application.

3,578,436
PROCESS FOR PRODUCING ALUMINUM
Warren E. Becker, Baton Rouge, La., and Paul Kobetz, Southfield, Mich., assignors to Ethyl Corporation, New York, N.Y.
No Drawing. Filed Aug. 20, 1968, Ser. No. 766,013
Int. Cl. B22f *9/00;* **C22b** *21/00*
U.S. Cl. 75—.5 **25 Claims**

Aluminum is produced by thermocatalytic disproportionation of dialkylaluminum hydride into aluminum, trialkylaluminum and hydrogen. The amount of olefin liberated, if any, is very small. Unitary operations using the disproportionation reaction for converting crude aluminum into purified aluminum are described. One such operation involves the following:

$$\text{Crude Al} + 2R_3Al + 3/2\ H_2 \longrightarrow 3R_2AlH + \text{solids}$$

$$3R_2AlH \xrightarrow{\text{catalyst}} \text{Purified Al} + 2R_3Al + 3/2\ H_2$$

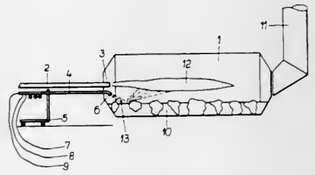
which reduces to

$$\text{Crude Al} \xrightarrow{\text{catalyst}} \text{Purified Al} + \text{solids}$$

3,578,437
METHOD OF SINTERING ORES
Masaaki Higuchi, Teiji Shibuya, Koichi Onoue, and Seiji Fujii, Fukuyama-shi, Hiroshima-ken, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan
Filed Sept. 25, 1968, Ser. No. 762,565
Claims priority, application Japan, Oct. 2, 1967, 42/63,214
Int. Cl. C22b *1/20*
U.S. Cl. 75—5 **8 Claims**

In a method of sintering ores, the temperature distribution pattern of the fracture of sintered cakes is measured and the measured value is compared with a predetermined reference temperature distribution pattern to derive a deviation signal which is used to control one or more of the factors that influence the sintering property.

3,578,438
PROCESS FOR FLAME REFINING OF COPPER SMELTS
Horst Dieter Iken, Dusseldorf, and Wolfgang Hans Trappmann, Heiligenhaus, Germany, assignors to Messer Griesheim GmbH, Frankfurt am Main, Germany
Filed Oct. 10, 1967, Ser. No. 674,188
Claims priority, application Germany, Oct. 19, 1966, M 71,328
Int. Cl. C22b *15/06*
U.S. Cl. 75—73 **2 Claims**

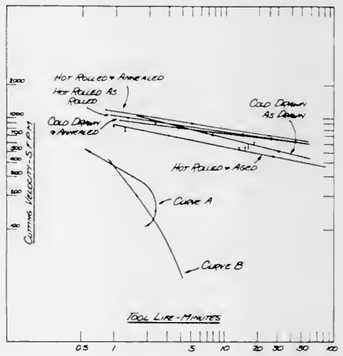


In a flame refining process of copper smelts in a rotary calciner wherein oxygen is blown through an individual nozzle or lance to the flame burning in the furnace, the oxygen is blown so that its effect on the smelting charge is to oxidize a considerable portion of the charge during smelting, with the highest flame temperature being on the underside of the flame.

3,578,439
AMALGAMATION PROCESS
Maximillian R. Merriman, Upper Hibernia Road, Rockaway, N.J. 07866
No Drawing. Filed July 2, 1968, Ser. No. 741,891
Int. Cl. C22c *5/00, 7/00, 35/00*
U.S. Cl. 75—129 **10 Claims**

Methods for amalgamating iron, platinum, and ferrous alloys, by acid cleaning the material to be amalgamated and permitting moisture to remain or form on the cleaned metal prior to dipping in amalgam.

3,578,440
NICKEL-COPPER ALLOY
Herbert L. Eiselstein and Carl B. Haeberle, Huntington, W. Va., assignors to The International Nickel Company, Inc., New York, N.Y.
Filed Mar. 25, 1968, Ser. No. 715,898
Int. Cl. C22c *19/00*
U.S. Cl. 75—170 **5 Claims**

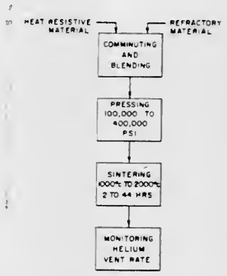


An age hardenable nickel-copper alloy having markedly improved weldability and machinability which alloy contains not more than about 0.1% carbon, not more than about 0.5% titanium, about 2.5% to about 3.5% aluminum, about 63% to about 70% nickel and the balance, except for incidental elements and impurities, essentially copper.

3,578,441
ALLOY
Otto Knotek, Lausanne, Switzerland, assignor to Eutectic Corporation, Flushing, N.Y.
No Drawing. Filed Nov. 4, 1968, Ser. No. 773,285
Int. Cl. C22c *19/02*
U.S. Cl. 75—171 **4 Claims**

This invention relates to an alloy capable of being polished to a mirrorlike finish. The alloy is very hard having a hardness of up to 1200 on the Vickers scale and comprises a nickel base with high boron content, up to nine percent by weight, with chromium.

3,578,442
METHOD OF MAKING MEANS FOR VENTING HELIUM FROM A RADIOISOTOPE CONTAINER
Charles G. Anderson, Carlisle, Ohio, assignor to the United States of America as represented by the United States Atomic Energy Commission
Filed Oct. 15, 1968, Ser. No. 768,225
Int. Cl. C22c *1/04*
U.S. Cl. 75—206 **4 Claims**



Filter means and method of making the same for venting helium gas through a radioisotope container wall and preventing or minimizing escape of radioisotopes and radioactivity, comprising a porous tablet forming a part of the wall including a pressed and sintered particulate blend of a refractory metal and a heat resistive material to provide porosity and strength at elevated temperatures.

3,578,443
METHOD OF PRODUCING OXIDE-DISPERSION-STRENGTHENED ALLOYS
Nicholas J. Grant, Winchester, and William F. Schilling, Boston, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
No Drawing. Filed Jan. 21, 1969, Ser. No. 792,817
Int. Cl. C22c *1/04*
U.S. Cl. 75—206 **18 Claims**

A method is disclosed for producing an alloy having a fine uniformly dispersed hard refractory oxide material in a ductile matrix metal. The alloy is made from an alloy powder, the individual particles of which each contain the metal of which the refractory oxide is formed and the matrix metal, the oxide-producing reactive metal being one that has a much greater affinity for oxygen than the matrix metal and is soluble in the matrix metal. The powder particles are formed preferably into thin flakes,

of the order of 5 microns or less thick, in a controlled oxygen containing environment to oxidize the surfaces of both the reactive metal and the matrix metal in a thin film. The alloy powder flakes produced are thin enough to allow oxidation of a substantial portion of the reactive metal and a portion of the matrix metal to some predetermined degree. The oxidized flakes are then placed in a neutral or inert environment at an elevated temperature to remain a sufficient time to allow the matrix oxides to react with the matrix and thereby to supply oxygen to the reactive metal to oxidize the reactive metal within the interior of the flakes. The flake powders, now free of matrix oxide or oxygen in solution, are compacted, heat is applied to bring the temperature of the compact to a hot working temperature while maintaining the inert environment, and the compact is extruded or otherwise hot worked to a wrought alloy form. Favorable results for some purposes have been obtained by reducing the surface matrix metal oxides without the internal oxidation step, and then following the further steps mentioned to provide the wrought alloy.

3,578,444
METHOD OF MAKING POSITIVE-WORKING LITHOGRAPHIC PLATES BY ELECTROSTATIC IMAGE

Julius L. Silver, Franklin Township, Somerset, N.J., assignor to Union Carbide Corporation

No Drawing. Filed June 13, 1968, Ser. No. 736,554

Int. Cl. G03g *13/22*

U.S. Cl. 96—1 **9 Claims**

Method for making positive-working lithographic plates by electrostatic imaging which involves coating an insolubilized olephilic, hydrophobic substrate having admixed therewith a chromium trioxide component with a thin coating of a photoconductive material suspended in a binder, electrostatically charging the coating in the dark, and exposing the charged surface to a light image generated by projection or reflection. Thereupon, the image is devolped by the application of a suitable toner. A solution of a photosensitizing agent is then applied. Exposure of this surface to actinic light causes the light struck areas of the plate to become hydrophilic and oleophobic. The photoconductive material-binder coating can then be removed.

3,578,445
XEROGRAPHIC PLATE FABRICATION

John J. Elchisak, Webster, William D. Hope, Rochester, and Edward M. Van Wagner, Webster, N.Y., assignors to Xerox Corporation, Rochester, N.Y.

Original application Sept. 26, 1963, Ser. No. 311,872, now Patent No. 3,341,681. Divided and this application June 22, 1967, Ser. No. 648,166

Int. Cl. G03g *5/04*

U.S. Cl. 96—1.5 **4 Claims**

A xerographic drum and method for fabricating the same wherein a flexible, conductive, sheet-like substrate having a photoconductive surface thereon is bonded to the surface of a drum blank. A lateral fold is formed in the flexible substrate along one edge thereof which edge becomes the trailing edge when the substrate is placed on the drum blank. The leading or non-folded edge of the flexible substrate is bonded to the drum surface and as the drum blank is rotated, the flexible substrate is held taut to produce a tightly wrapped relationship therebetween. The trailing or folded edge is placed in overlapping relationship to the bonded leading edge and the trailing portion of the substrate bonded to the drum blank at a point preceding the fold. After bonding of the trailing portion of the substrate, the fold, as a result of the resiliency of materials, produces a tight, flexible seal which prevents developer material from accumulating between the drum blank and the substrate.

3,578,446
ELECTROPHOTOGRAPHIC REPRODUCTION EMPLOYING BI-CHARGING AND NEGATIVE-CHARGING ZINC OXIDE

Meyer L. Sugarman, Northbrook, Ill., assignor to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Filed July 26, 1967, Ser. No. 657,471

Int. Cl. G03g *5/00*

U.S. Cl. 96—1.8 **4 Claims**

Direct electrostatic duplication processes are often plagued with problems of background printing. The inclusion of bi-charging zinc oxide, and/or of polyvinyl alchohol in the coating composition applied to the paper or other substrate will greatly reduce this problem.

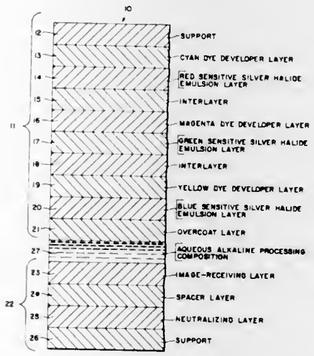
3,578,447
DYE DEVELOPER COLOR DIFFUSION TRANSFER PROCESSES AND ELEMENTS COMPRISING ALPHA AND GAMMA HYDROXY AND GAMMA AMINO SUBSTITUTED PYRIDINES

Myron S. Simon, West Newton, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 2, 1969, Ser. No. 821,191

Int. Cl. G03c *5/54, 7/00*

U.S. Cl. 96—3 **19 Claims**



Dye-developer diffusion transfer color processes and elements and compositions for employment therein, comprising a compound selected from alpha and gamma hydroxy and gamma amino substituted pyridines adapted to react with the oxidation products of the dye developers

to provide during processing a product which is less diffusible in the processing composition than the said dye developer oxidation products.

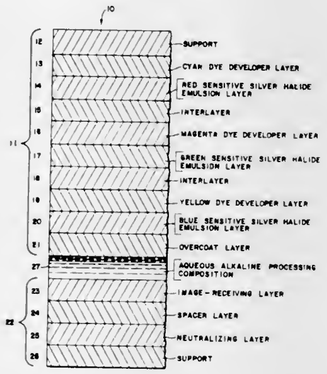
3,578,448
DIFFUSION TRANSFER DYE DEVELOPER PROCESSES AND PRODUCTS EMPLOYING ORTHO AND PARA HYDROXY AND PARA AMINO SUBSTITUTED PYRIDINES

Stanley M. Bloom, Waban, Myron S. Simon, West Newton, and Jeanne A. Ward, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 20, 1968, Ser. No. 785,624

Int. Cl. G03c *7/20*

U.S. Cl. 96—3 **19 Claims**



The present invention relates to photographic diffusion transfer dye developer processes employing ortho and para hydroxy and para amino substituted pyridines and film units specifically adapted for the performance of such processes.

3,578,449
TRANSFER IMAGE PROCESS UTILIZING AN ORGANIC PHOSPHINE AS SILVER HALIDE SOLVENT

Stanley M. Bloom, Waban, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

No Drawing. Filed Jan. 22, 1968, Ser. No. 699,300

Int. Cl. G03c *5/54*

U.S. Cl. 96—29 **10 Claims**

Organic derivatives of the trihydrides of trivalent elements in Group V-A of the Periodic Table having an atomic number greater than 7 and less than 83 are used as silver halide solvents in photographic processing compositions. Specifically, organic phosphines, arsines, stibines and mixtures thereof are used in photographic processing compositions which find particular utility in silver diffusion transfer techniques.

3,578,450
DIFFUSION TRANSFER PRODUCTION OF REFLECTION POSITIVE WITH ALUMINUM STEARATE IN RECEPTIVE STRATUM

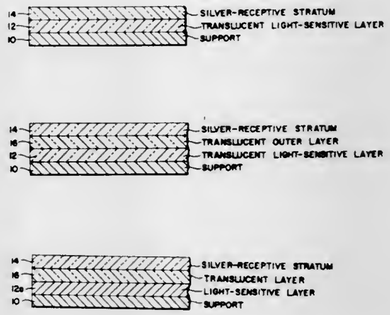
Edgar W. Miller, Newton Center, and Harry A. Smith, Concord, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 22, 1968, Ser. No. 723,003

Int. Cl. G03c *5/54*

U.S. Cl. 96—29 **12 Claims**

Photographic products for forming a composite print viewable as a positive silver image, including a silver halide emulsion layer, an opacifying material in the emulsion layer and/or in an overlying layer, and an outer



layer comprising a silver-receptive stratum, wherein the silver-receptive stratum includes a reagent comprising essentially aluminum stearate.

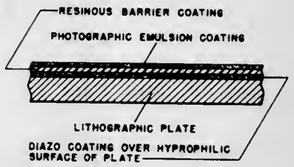
3,578,451
INTEGRAL NEGATIVE TYPE POSITIVE PHOTOLITHOGRAPHIC PLATE

Towers Doggett, Westbrook, Maine, assignor to Scott Paper Company, Delaware County, Pa.

Filed Mar. 29, 1967, Ser. No. 626,874

Int. Cl. G03f *7/02*

U.S. Cl. 96—33 **2 Claims**



A normally negative-working lithographic plate is coated with a conventional silver halide emulsion, an intermediate water-barrier coating being used to prevent co-mingling of the sensitized layers. The resulting plate is image-wise exposed to a positive original and developed to form as in-situ mask or integral negative for a subsequent exposure of the diazo layer. Following the second exposure the emulsion layer is removed and the resulting plate used to reproduce the original positive pattern.

3,578,452
DEVELOPING COMPOSITIONS FOR DIAZOTYPE MATERIALS

Konrad Parker, Park Ridge, Ill., assignor to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

No Drawing. Continuation-in-part of application Ser. No. 440,752, Mar. 18, 1965. This application Sept. 12, 1968, Ser. No. 759,503

Int. Cl. G03c *1/58*

U.S. Cl. 96—49 **8 Claims**

Diazotype developing compositions comprising a liquid organic amine such as morpholine, alkylmorpholine, piperidine, alkylpiperidine, or an amine of the formula

wherein R_1 is hydroxyalkyl, cycloalkyl or aralkyl dissolved in a polyhydric alcohol, a glycol ether or a monohydric alcohol containing at least six carbon atoms with water in an amount not greater than the weight of the organic solvent.

3,578,453
COLOR PHOTOGRAPHIC PROCESSING WITH WATER SOLUBLE AMINES AND SALTS THEREOF
Hiroyuki Amano, Haruhiko Iwano, Kazuo Shirasu, and Reiichi Ohi, Kanagawa, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Kanagawa, Japan
No Drawing. Filed Jan. 5, 1968, Ser. No. 695,892
Claims priority, application Japan, Jan. 6, 1967, 42/1,306
Int. Cl. G03c *5/32*
U.S. Cl. 96—60 **16 Claims**

The present invention relates to a method of processing color photographic light sensitive elements and particularly to a bleaching process for color photographic light sensitive elements by processing them in a bleaching solution containing at least one member selected from the group consisting of an aliphatic primary amine, an aliphatic secondary amine, an aliphatic tertiary amine, and a salt thereof, said amine being represented by the general formula

wherein R_1, R_2 and R_3 represent a member selected from the group consisting of a hydrogen atom, an unsubstituted alkyl group, a substituted alkyl group, an unsubstituted aliphatic group, a substituted aliphatic group, and a heterocyclic ring with another group, the total number of carbon atoms in R_1, R_2 and R_3 being less than 12.

3,578,454
COLOR PHOTOGRAPHIC PROCESSING
Hiroyuki Amano, Relichi Ohi, Haruhiko Iwano, and Kazuo Shirasu, Kanagawa, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Kanagawa, Japan
No Drawing. Filed Dec. 13, 1967, Ser. No. 690,068
Claims priority, application Japan, Dec. 14, 1966, 41/81,967
Int. Cl. G03c *5/32, 5/38*
U.S. Cl. 96—60 **12 Claims**

A method of color processing for a photographic light-sensitive color element comprising, at least, development, stop-fixing, and bleach-fixing, the improvement which comprising processing the light-sensitive element in a bath containing a water-soluble iron complex salt and a compound represented by the general formula:

$$H_2N(ANH)_nANH_2$$

wherein A represents an alkylene group having from 2 to 4 carbon atoms and *n* is a positive integer, the bath being a bleach-fixing bath or a separate bath in which the element is processed, after color development, but no later than bleach-fixing.

3,578,455
INCREASED SPEED IN R—C—X_3/COLOR FORMER LIGHT SENSITIVE SYSTEM BY ALKALI TREATMENT
Victor P. Petro, Brecksville, James M. Lewis, Cleveland, and Robert D. Fox, University Heights, Ohio, assignors to Horizons Incorporated, a Division of Horizons Research Incorporated
No Drawing. Filed Mar. 11, 1968, Ser. No. 711,832
Int. Cl. G03c *1/72*
U.S. Cl. 96—90 **25 Claims**

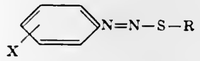
Photosensitive compositions consisting essentially of (1) an organic halogen compound which produces free radicals when exposed to a suitable dose of radiant energy and (2) a styryl quinoline or other dye base are found to be improved by treatment of the dye base with an alkali metal hydroxide, whereby the resulting composition has more speed, i.e., it can be devloped for longer intervals before the amount of fogging becomes objectionable.

3,578,456
NON-SILVER PHOTOSENSITIVE COMPOSITION SENSITIZED WITH RUBRENE
Victor P. Petro, Brecksville, James R. Cable, Macedonia, and Eugene Wainer, Shaker Heights, Ohio, assignors to Horizons Incorporated, a Division of Horizons Research Incorporated
Filed May 9, 1968, Ser. No. 728,002
Int. Cl. G03c *1/72*
U.S. Cl. 96—90 **8 Claims**

Non-silver photosensitive compositions adapted to be developed by optical means, said compositions being provided with sensitivity extending into the red by the addition thereto of merocarbocyanines or a merocyanine.

3,578,457
PHOTOSENSITIVE DIAZOTHIOETHER MATERIAL
Harke Jan Houtman, Cornelis Johannes Schoot, Jan Boven, and Leendert Klaas Hellinga van Beek, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
No Drawing. Filed Feb. 10, 1969, Ser. No. 798,127
Claims priority, application Netherlands, Feb. 13, 1968, 6802059
Int. Cl. G03c *1/52, 1/62, 1/76*
U.S. Cl. 96—91 **4 Claims**

A photosensitive material which consists of a support which is electrically non-conductive at least at its surface with a photosensitive layer, the active compound of which consists of an aromatic diazothioether of the type



in which Formula X is one or more substituents, preferably 4-nitro or 3,5-dichloro - 4 - dimethylamino, and in which Formula R is a branched or non-branched alkyl group or aralkyl group.

3,578,458
IONICALLY CROSS-LINKED PHOTOPOLYMERIZED ADDITION POLYMERS
Lloyd D. Taylor, Everett, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
No Drawing. Filed Oct. 5, 1966, Ser. No. 584,353
Int. Cl. G03c *1/68*
U.S. Cl. 96—115 **1 Claim**

Unsaturated monomers containing ionic sites are photopolymerized and, further, ionically cross-linked through these sites. Examples of unsaturated monomers containing ionic sites are zwitterions.

3,578,459
FOOD PRODUCT
James E. Corbin, Webster Groves, Mo., assignor to The Ralston Purina Company, St. Louis, Mo.
No Drawing. Filed July 18, 1968, Ser. No. 745,682
Int. Cl. A23l *1/10*
U.S. Cl. 99—1 **16 Claims**

The method of producing a novel food product comprising coating the surfaces of a substantially dry food product with an edible, chemically reactive composition which, when contacted with an aqueous liquid, forms an exothermic reaction, thereby producing a resulting heated food product.

3,578,460
PROCESS FOR THE PREPARATION OF PROTEINACEOUS MATERIALS
Lloyd E. Weeks, Creve Coeur, and Bernard S. Wildi, Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Dec. 12, 1968, Ser. No. 783,391
Int. Cl. A23j *3/00*
U.S. Cl. 99—7 **8 Claims**

An edible proteinaceous material having nutritional value is prepared by digesting non-edible protein materials from domestic animals, for example, feathers, in a liquid medium comprising water, keratinase and a reductive-type disulfide splitting agent. Reductive-type disulfide splitting agents are exemplified by mercaptoethanol and sodium sulfite. The procedure is typically carried out at a temperature in the range of from about 10° to about 70° C. The proteinaceous material is useful in animal feed compositions.

3,578,461
PROCESS FOR THE PREPARATION OF PROTEINACEOUS MATERIALS
Lloyd E. Weeks, Creve Coeur, and Bernard S. Wildi, Kirkwood, Mo., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Dec. 12, 1968, Ser. No. 783,408
Int. Cl. A23j *3/00*
U.S. Cl. 99—7 **12 Claims**

An edible proteinaceous material having nutritional value is prepared by digesting non-edible protein materials from domestic animals, for example, feathers, in a liquid medium comprising water and an enzyme selected from the group consisting of alkaline protease, neutral protease and mixtures of said enzymes. Optionally a reductive-type disulfide splitting agent as exemplified by mercaptoethanol may be included. The procedure is typically carried out at a temperature in the range of from about 10° to about 70° C. The proteinaceous material is useful in animal feed compositions.

3,578,462
YEAST LEAVENED BREAD DOUGH COMPOSITION AND PROCESS OF MANUFACTURE
Louis J. Smerak, Wayne, and Jason A. Miller, Dover, N.J., assignors to Caravan Products Co., Inc., Passaic, N.J.
No Drawing. Continuation-in-part of application Ser. No. 566,212, July 19, 1966. This application Dec. 2, 1969, Ser. No. 881,609
The portion of the term of the patent subsequent to Feb. 10, 1987, has been disclaimed
Int. Cl. A21d *2/02, 2/04, 8/04*
U.S. Cl. 99—90 **26 Claims**

A yeast leavened bread dough containing a composition consisting essentially of about 0.0005 to 0.010 part by weight per 100 parts of flour employed in the dough of an oxidizing agent, about 0.03 to 1.0 part by weight of calcium salt per 100 parts flour employed in the dough, and catalytically active quantities of enzyme selected from the class consisting of fungal amylase and fungal protease, wherein the fungal alpha amylase enzyme is sufficient to provide between 3,000 and 150,000 SKB units for 100 pounds of flour employed in the dough and the fungal protease enzyme is sufficient to provide between 3,000 and 500,000 hemoglobin units for 100 pounds of flour employed in the dough.

3,578,463
MICROWAVE BLANCHING
Franklin J. Smith, Diablo, and L G Williams, Martinez, Calif., assignors to Cryodry Corporation, San Ramon, Calif.
Filed Mar. 8, 1967, Ser. No. 621,645
Int. Cl. A23b *7/06;* **A23l** *3/18*
U.S. Cl. 99—103 **4 Claims**

Treating vegetables by successively hot water blanching with water above 185° F. or atmospheric steam, finish blanching with the application of microwave energy to the point of enzyme deactivation and finish blanching with hot water above 185° F. Optionally, a final quench in cold water may be used.

3,578,464
METHOD OF RIPENING FRUIT
Christos C. Mpelkas, Lynn, Mass., asignor to Sylvania Electric Products Inc.
Filed May 18, 1967, Ser. No. 639,459
Int. Cl. A23l *1/00*
U.S. Cl. 99—103 **4 Claims**

Ripening fruit that is detached from the vine unripened by exposing the fruit intermittently to periods of several hours of light being followed by several hours of darkness, the light being confined substantially to the blue, red and far red regions of the spectrum and maintaining the temperature lower during the dark period than during the light period.

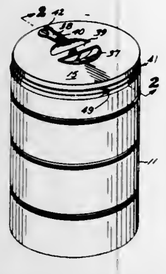
3,578,465
FLAVOURING COMPOSITIONS
Antonie Simon Maria van der Zijden, deceased, late of Duiven, Netherlands, by Regina Christina Maria van der Zijden-Willemse, legal representative of the heirs, Duiven, Netherlands, assignor to Lever Brothers Company, New York, N.Y.
No Drawing. Filed May 22, 1968, Ser. No. 731,338
Claims priority, application Netherlands, May 25, 1967, 6707232
Int. Cl. A23l *1/22*
U.S. Cl. 99—140 **21 Claims**

An artificial flavouring composition comprising pyrrolidone carboxylic acid or a precursor thereof such as glutamine and succinic acid. The weight ratio of the acids, calculated as the free acid, is pyrrolidone carboxylic acid 1 part to succinic acid 0.01 up to 5 parts. The compositions can also include glutamic acid and then the weight ratio, of pyrrolidone carboxylic acid to glutamic acid is 1 to 0.02 up to 50 parts, and may also include a 5′-ribonucleotide, the weight ratio of pyrrolidone carboxylic acid to 5′-ribonucleotide being 1 to 0.01 up to 10 parts.

3,578,466
PICKLED VEGETABLE PRODUCT AND PROCESS OF PREPARATION
Frederick Hugo Luckmann, Westfield, and Daniel Melnick, Teaneck, N.J., assignors to CPC International Inc.
No Drawing. Filed May 21, 1968, Ser. No. 730,953
Int. Cl. A23b *7/10*
U.S. Cl. 99—156 **5 Claims**

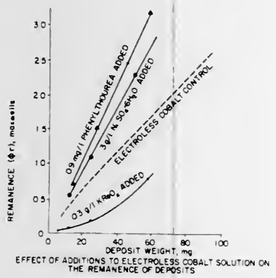
The present invention relates to enhancing on aging the flavor, color, and texture of pickled vegetables by the addition of an edible alkylenediaminetetracarboxylic acid component in minor proportions. The alkylenediaminetetracarboxylic acid component is added either in a brine solution in which the vegetables to be pickled are treated, or in the pickling syrup solution during the manufacture of vegetable pickles. The alkylenediaminetetracarboxylic acid component is present in amounts ranging from 0.004% to 0.04%. There is a synergistic reaction between the alkylenediaminetetracarboxylic acid component and calcium chloride, the latter in 0.04 to 0.1% concentration, in providing aged products of improved crispness.

3,578,467
VARIABLE VOLUME COFFEE CONTAINER
Richard R. Huber, 853 Rincon Lane, Palos Verdes Estates, Calif. 94306
Filed Sept. 5, 1968, Ser. No. 757,596
Int. Cl. B65b *25/00*
U.S. Cl. 99—182 **3 Claims**



A coffee container apparatus including an open top can which receives a plunger type cover that closely fits the wall of the can and is insertable downwardly thereinto to force the air there out of to come to rest on the top of the coffee and hermetically seal air from contact therewith whereby the coffee aroma will be maintained. The cover may include an upwardly and outwardly flared, resilient, peripheral lip which deforms to conform to the can wall configuration for assuring positive hermetic sealing.

3,578,468
SOLUTION FOR DEPOSITING AN ELECTROLESS COBALT ALLOY
Fred Pearlstein and Robert F. Weightman, Philadelphia, Pa., assignors to the United States of America as represented by the Secretary of the Army
Filed Mar. 1, 1968, Ser. No. 709,620
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 **6 Claims**



EFFECT OF ADDITIONS TO ELECTROLESS COBALT SOLUTION ON THE REMANENCE OF DEPOSITS

Additions to an electroless cobalt solution of sodium tungstate, potassium perrhenate, nickel sulfate or phenylthiourea yielded electroless cobalt alloy deposits having a variety of improved magnetic properties.

3,578,469
REMOVAL OF FERROUS SULFATE FROM NICKEL BATHS
Richard N. Hudd, Wheaton, and Heinz Seiler, Cicero, Ill., assignors to Eagle-Picher Industries, Inc., Cincinnati, Ohio
No Drawing. Filed Mar. 24, 1969, Ser. No. 810,012
Int. Cl. C23c *3/02*
U.S. Cl. 106—1 **8 Claims**

Process for the removal of ferrous sulfate from nickel plating solutions which involves adding hydrogen peroxide to the solution and adjusting the pH to a value of about 3.1 to 3.3 to thereby precipitate ferric sulfate in a form which can be readily removed from the remainder of the solution by filtration.

3,578,470
BaO-Al_2O_3-SiO_2 GLASS-CERAMIC MATERIALS
Dov Bahat, 77 E. 1st St., Corning, N.Y. 14830, and Gordon P. K. Chu, 1 Overbrook Road, Painted Post, N.Y. 14870
Filed Nov. 12, 1968, Ser. No. 774,687
Int. Cl. C03c *3/22*
U.S. Cl. 106—39 **2 Claims**

This invention relates to the production of glass-ceramic materials in the composition field BaO-Al_2O_3-SiO_2 nucleated with Ta_2O_5 and/or Nb_2O_5 which are especially suitable for sealing to tungsten and/or molybdenum metal and their alloys.

3,578,471
THERMAL SHOCK RESISTANT CERAMIC MATERIAL
Irwin M. Lachman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Continuation-in-part of application Ser. No. 668,067, Sept. 15, 1967. This application Nov. 10, 1969, Ser. No. 875,174
Int. Cl. C04b *35/00, 35/44*
U.S. Cl. 106—39 **12 Claims**

Ceramic bodies composed of a plurality of phases having markedly different coefficients of thermal expansion. The ceramic bodies are characterized by grain boundary and intracrystalline cracking. The ceramics have compositions analytically defined by and selected from the groups consisting of: (1) first compositions in the area and along the boundaries defined by the letters A, B, C, D, E, F, G, M, N in FIG. 1 of the drawing; (2) second compositions in the area and along the boundaries defined by the letters A′, B′, C′, D′, E′, F′, G′, M′, N′ in FIG. 2 of the drawing, and (3) mixtures of said first and second compositions.

3,578,472
CARBONACEOUS BONDING SYSTEM FOR REFRACTORIES
George R. Henry, Bethel Park, and Ernest P. Weaver, Pittsburgh, Pa., assignors to Dresser Industries, Inc., Dallas, Tex.
No Drawing. Filed Nov. 3, 1967, Ser. No. 680,320
Int. Cl. C04b *35/02, 35/52*
U.S. Cl. 106—56 **9 Claims**

Carbonaceous bonding system for refractories, especially basic refractories, of increased storage life, which system does not normally require heating for use. Said system being mainly comprised of unsaturated fatty acid pitch plus an effective amount of that portion of pitches generally referred to as asphaltenes.

3,578,473
BASIC FUSED REFRACTORY WITH RARE EARTH OXIDE
Allen M. Alper and Robert N. McNally, Corning, N.Y., assignors to Corhart Refractories Company, Louisville, Ky.
No Drawing. Filed May 17, 1968, Ser. No. 729,894
Int. Cl. C04b *35/40*
U.S. Cl. 106—58 **5 Claims**

Basic fused refractory material analytically composed of, by weight, at least 70% MgO, 1 to 25% rare earth oxide, 0 to 20% FeO, 0 to less than 15% of TiO_2, ZrO_2, Cr_2O_3 and mixtures thereof, 0 to less than 10% of SiO_2, Al_2O_3, B_2O_3, fluorine and mixtures thereof, 0 to 3.5% P_2O_5, and 0 to 3% ThO_2. Material can be in form of either fused cast articles or fused grain or rebonded fused grain article.

3,578,474
FUSED REBONDED BASIC BRICK
Dwight S. Whittemore, Bethel Park, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.
No Drawing. Filed Oct. 3, 1967, Ser. No. 672,455
Int. Cl. C04b *35/42*
U.S. Cl. 106—59 **7 Claims**

Ceramically bonded basic brick made from a batch comprising at least two chemically different fused magnesite-chrome ore grains being in different size fractions of the batch.

3,578,475
CATIONIC CEREAL FLOURS AND A METHOD FOR THEIR PREPARATION
Richard J. Alexander, Wauwatosa, and Robert G. Cummisford, Brookfield, Wis., assignors to Krause Milling Company, Milwaukee, Wis.
No Drawing. Filed Dec. 9, 1968, Ser. No. 782,438
Int. Cl. C13l *1/08*
U.S. Cl. 106—150 **6 Claims**

A series of novel cationic cereal flours are described in which the protein portion of the flour is modified by certain tertiary amines or quaternary ammonium salts.

3,578,476
DYESTUFFS FOR ORNAMENTAL COATINGS OR THE LIKE
Robert J. Perkel, R.D. 3, Lamington Road, Branchburg Township, Somerset County, N.J. 07826
No Drawing. Filed Apr. 3, 1969, Ser. No. 813,282
Int. Cl. C08h *17/02*
U.S. Cl. 106—193 **10 Claims**

The specification describes a dyestuff useful for ornamental coatings. The dyestuff is produced by reacting an organic titanate with a phenolic substance, conveniently a phenolic resin. The product is soluble in most organic finishes and produces a metallic gold finish on neutral-colored metal surfaces.

3,578,477
PAPER SIZING COMPOSITION COMPRISING A CATIONIC WAX EMULSION, AN ANIONIC ROSIN AND AN ACID AMINE CONTAINING EMULSIFYING AGENT
Donald R. Cushman, Wenonah, N.J., assignor to Mobil Oil Corporation
No Drawing. Filed July 17, 1969, Ser. No. 842,724
Int. Cl. C08h *9/10*
U.S. Cl. 106—230 **16 Claims**

A paper sizing composition is provided comprising a mixture of an aqueous cationic wax emulsion and an anionic rosin size.

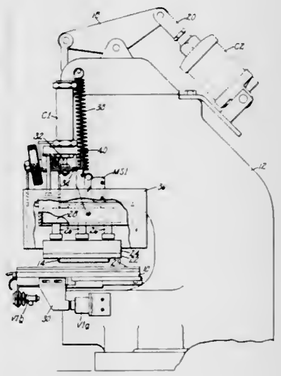
3,578,478
SLIP CASTING OF TUNGSTEN
Craig T. Waldo, Towanda, Pa., assignor to Sylvania Electric Products Inc.
No Drawing. Filed Sept. 16, 1968, Ser. No. 762,327
Int. Cl. C08h *17/24;* **B22f** *3/22*
U.S. Cl. 106—286 **6 Claims**

An improved method of making a tungsten slip casting slurry is disclosed. The slurry may contain only water as the suspending agent due to the controlled density and size of the tungsten powder.

3,578,479
METHOD OF SEALING LEAKS IN VESSELS AND JOINTS
Joseph J. Packo, 3043 N. Federal Highway, Fort Lauderdale, Fla. 33306
No Drawing. Filed Oct. 29, 1968, Ser. No. 771,622
Int. Cl. B23p *7/00*
U.S. Cl. 117—2 **11 Claims**

The invention relates to a method for sealing leaks in pipes, conduits, gas lines, closed containers, tanks and the like. The interior of such equipment is first purged with a non-reactive dry gas, such as nitrogen, to remove any moisture and/or oxygen which may be present. Then a selected sealant agent is introduced into the interior of the equipment in a suitable inert gas vehicle under pressure. The sealant and gas mixture will escape from any leaks present in the equipment into the outer ambient atmosphere. The sealant reacts with oxygen and/or moisture to form in the situs of the leak a solid reaction product which may be a metal oxide compound. The sealant agents used are normally gaseous or volatile metal hydrides, metal alkyls, metal alkyl halides, and metal alkyl hydrides. Examples of these sealant agents are silicon hydrides, alkyl aluminum halides, zinc alkyls such as diethyl zinc. The sealants are supplied to the interior of the apparatus or vessel which may contain leaks in sufficient concentration and suitable pressure so that upon escape from the leaks a solid seal will form in situ.

3,578,480
METHODS OF ORNAMENTING PLIABLE SHEET MATERIAL
Sydney A. Vinter, Leicester, England, assignor to USM Corporation, Fleming, N.J.
Filed Oct. 1, 1968, Ser. No. 764,089
Claims priority, application Great Britain, Oct. 5, 1967, 45,336/67
Int. Cl. B44d *1/52, 5/00*
U.S. Cl. 117—4 **3 Claims**



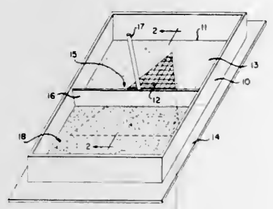
In ornamenting pliable sheet material, a surface area thereof is provided with a layer of masking material and subjected to pressure from a cutting die to sever the layer and indent the sheet material along lines defining area portions to be colored. The masking layer is removed from the area portions which are then spray coated, and thereafter the remaining masking layer is removed. The materials adjacent the edge of the cutting die are heated during pressure thereof to promote severance of the layer and the fixation of the embossment so that the area portions are sharply defined and stand out handsomely. The

heating is effected by emanations from the die, suitably in the form of a heat flux or an RF field but preferably both.

3,578,481
SUEDE-LIKE SHEET MATERIAL OF STYRENE/BUTADIENE POLYMER CONTAINING AN ADDITIVE
Charles A. Young, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed June 18, 1968, Ser. No. 737,824
Int. Cl. B44f *9/00, 9/12*
U.S. Cl. 117—8 **11 Claims**

An improved supple, synthetic, microporous vapor permeable suede-like sheet material of a non-woven synthetic flexible fibrous web that is impregnated with a polymeric binder of styrene and butadiene and the polymeric binder contains about 0.1–10 parts of a silicone oil additive per 100 parts of polymeric.

3,578,482
METHOD OF COATING A SUBSTRATE WITH CAPSULES
John G. Whitaker, Englewood, and Victor A. Crainich, Jr., Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Filed May 5, 1969, Ser. No. 821,737
Int. Cl. B05c *1/16;* **B44d** *1/14*
U.S. Cl. 117—38 **14 Claims**



A process in which a dispersion containing an inert liquid vehicle, for example, water, a binder such as polyvinyl alcohol and a profusion of capsules having elastic, readily distored walls containing liquid internal core material such as an odoriferous substance are coated through a screen onto a substrate by the application of pressure to the capsular dispersion. The capsule walls are subsequently hardened. The walls may then be ruptured by the application of pressure to the capsules to release the internal core material.

3,578,483
PROCESS FOR IMPROVING THE PRINTABILITY OF THE SURFACE OF α-CELLULOSE PAPER TO BE USED AS THE DECORATIVE SHEET IN A DECORATIVE LAMINATE
Leonardo Medrano Garcia, Lawrence, Mass., assignor to Formica Corporation, Cincinnati, Ohio
No Drawing. Filed May 14, 1969, Ser. No. 824,689
Int. Cl. B44d *5/02, 5/03*
U.S. Cl. 117—38 **5 Claims**

A process for improving the printability of α-cellulose paper which is to be used as the decorative sheet in a decorative laminate comprising placing thereon a discontinuous coating from an organic solvent solution of a mixture of certain acrylic copolymers with an inorganic pigment.

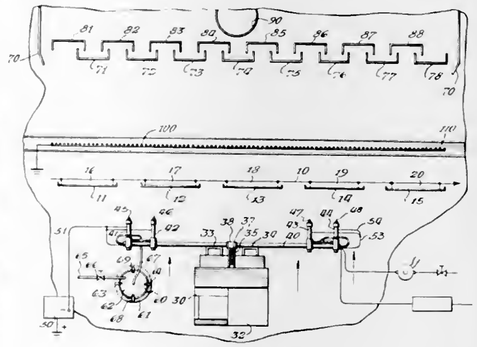
3,578,484
SURFACE PREPARATION AND ELECTROSTATIC SPRAY COATING OF PLASTIC ARTICLE
Wilhelm E. Walles and Arnett L. Bird, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Continuation-in-part of application Ser. No. 732,871, May 29, 1968. This application Feb. 13, 1969, Ser. No. 799,078
Int. Cl. B05b *5/02;* **B44d** *1/092*
U.S. Cl. 117—47 **12 Claims**

Process for the spray coating of plastic articles wherein the articles are surface sulfonated before they are electrostatic spray coated. The articles can be neutralized after sulfonation if desired. A degree of sulfonation of at least about 0.001 milligram sulfur trioxide or equivalents thereof per square centimeter of plastic surface is required to give the desired uniform coating and good adhesion. The sprayed coatings can be liquid paints or lacquers, powdered plastics and liquid coatings containing filamentary reinforcing agents which are normally cured by drying, heating and drying, or heating.

3,578,485
METHOD OF PRODUCING A COATED PAPER
Saburo Imoto, Sakazu Kurashiki-shi, Kyoichiro Ikari, Yasue Kurashiki-shi, and Tatsuaki Hattori, Sakazu Kurashiki-shi, Japan, assignors to Kuraray Co., Ltd., Sakazu, Kurashiki-shi, Japan
No Drawing. Filed July 26, 1968, Ser. No. 747,797
Claims priority, application Japan, Aug. 3, 1967, 42/50,241
Int. Cl. B44d *1/44*
U.S. Cl. 117—62 **10 Claims**

A process for producing a coated, paper, having improved water-resistance and superior printability characterized by treating the coated surface of a paper coated with a color composition containing as the principal constituent a pigment and a polyvinyl alcohol with a solution containing a boric compound having an electron accepting structure selected from the group consisting of boric acid and boric salts, a water-soluble amino compound having one or more of primary, secondary, tertiary or quaternary amino groups in its molecule, an electron donating structure and a boiling point in excess of about 100° C., and a surface active agent which reduces the surface tension of the treating solution.

3,578,486
ELECTROSTATIC COATING MATERIAL RECOVERY DEVICE
Joseph E. Fenton, Grimsby, Ontario, Canada, assignor to H. G. Fischer & Co.
Filed Oct. 9, 1967, Ser. No. 673,750
Int. Cl. B05b *5/02*
U.S. Cl. 117—93.41 **13 Claims**



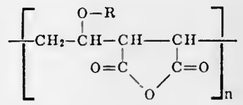
In electrostatic spray coating systems a barrier of electrical conductive aperture material is placed beyond the work to be coated to recover overspray. The barrier is either connected to the work to be coated so that it remains at the same potential or an auxilliary power supply is provided to increase the potential difference between a charging electrode and the barrier over the potential difference between the electrode and work being coated.

3,578,487
METHOD FOR RENDERING SUBSTRATES SOIL REPELLENT
Martin Knell, Ossining, and Eduard Karl Kleiner, Dobbs Ferry, N.Y., assignors to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Filed July 1, 1968, Ser. No. 741,298
Int. Cl. D06m *15/36;* **B44d** *1/02*
U.S. Cl. 117—121 **6 Claims**

Substrates, particularly textiles, are rendered soil, oil, and water repellent by the application thereto of compositions comprising polymers of N-(perfluoroalkanoyl) aminoethyl acrylate or N-(perfluoroalkanovl)-N-lower alkyl-aminoethyl acrylates.

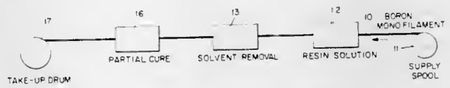
3,578,488
METHOD FOR RENDERING SUBSTRATES WATER REPELLANT
Howard Gary Ohlhausen, 82 Graymoor Lane, Olympia Fields, Ill. 60461
No Drawing. Filed June 21, 1968, Ser. No. 738,787
Int. Cl. C09d *3/48*
U.S. Cl. 117—123 **16 Claims**

A method for rendering substrates water repellant by treating the same with a composition containing a poly alkyl vinyl ether/maleic anhydride having the following formula:



wherein R is an alkyl radical having sufficient number of carbon atoms to render the polymer water insoluble, and *n* is an integer greater than 1. The polymer is preferably present in the composition in an amount 0.5–40% by weight. Other water repellant compounds or additives are advantageously included in the composition.

3,578,489
RESIN COATED FILAMENTARY MATERIAL
Leonard L. Gelb, Cumberland, Md., assignor to Hercules Incorporated, Wilmington, Del.
Filed Nov. 13, 1968, Ser. No. 775,254
Int. Cl. B44d *1/42;* **H01b** *3/36;* **B32b** *27/12*
U.S. Cl. 117—128.4 **16 Claims**



The invention provides (1) boron filament coated with a phenolic-polyvinyl acetal resin as a medium for bonding the filament to an epoxy type matrix material, (2) process for manufacture of the above coated boron filaments involving contact of bare boron filaments with a solution of said resins to wet the filament, regulating thickness of the resulting solution layer to provide the residual resin coating sought, removing solvent from the wetting layer, and partially curing residual solid resin as the resin coating, (3) broad goods comprising mat product of filamentary winding of the above described resin coated boron filaments, (4) method for forming a specific coating solution for the bare filaments, involving forming a separate solution of each of the resins in predetermined resin proportions and concentrations, and then admixing the two separate solutions to form the product solution and (5) resulting coating solution of 5–20 weight percent total resin content, in a phenolic resin to polyvinyl acetal resin weight ratio of from about 0.25:1 to 18:1.

3,578,490
MOLDED ARTICLES AND COATINGS BASED ON ORGANOPOLYSILOXANES
Ignaz Bauer, Rudolf Riedle, and Siegfried Nitzsche, Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Munich, Bavaria, Germany
No Drawing. Filed Feb. 7, 1968, Ser. No. 703,549
Claims priority, application Germany, Nov. 15, 1967, W 45,165
Int. Cl. B32b *27/28, 27/06*
U.S. Cl. 117—138.8 **4 Claims**

Molded articles and coatings prepared from organopolysiloxanes having olefinically unsaturated organic substituents bonded to silicon are coated with organosilicon compounds having SiN groups thereby reducing or eliminating the surface tackiness heretofore encountered.

3,578,491
WOOL-POLYESTER TEXTILE ARTICLES HAVING A POLYMERIC FINISH
James W. Dowd, Robert D. Jacobs, and Harry L. Mercer, Cheraw, S.C., assignors to J. P. Stevens & Co., Inc., New York, N.Y.
No Drawing. Filed May 23, 1968, Ser. No. 731,612
Int. Cl. B32b *27/36;* **D06m** *13/02, 3/02*
U.S. Cl. 117—138.8 **1 Claim**

This invention relates to woolen textile articles containing synthetic yarns, impregnated with a polymeric composition comprising

(1) a copolymer of vinyl acetate (40 to 60% by weight) and an enthylenically unsaturated acid (60 to 40% by weight) and
(2) an alkyd resin

and having substantially improved wash-wear properties.

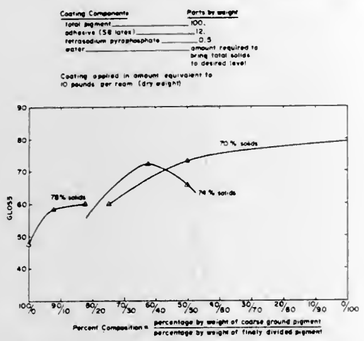
3,578,492
SIZED TWISTLESS YARNS
Edgar D. Bolinger, 113 Lanford Road, Spartanburg, S.C. 29301
Application Nov. 23, 1966, Ser. No. 596,657, now Patent No. 3,512,232, dated May 19, 1970, which is a continuation of application Ser. No. 250,320, Jan. 9, 1963. Divided and this application June 13, 1969, Ser. No. 832,953
Int. Cl. D02j *3/18*
U.S. Cl. 117—139.5 **5 Claims**

A twistless yarn containing at least some fibers having interlocking characteristics is described. The yarn is sized with a sizing agent comprising a frictioning agent, a binding agent and, optionally, an insolubilizing agent. An example of a frictioning agent is colloidal silica.

3,578,493
HIGH SOLIDS COATING COMPOSITION
Johanna Wilhelmina v.O Smith, Cape Elizabeth, Maine, assignor to The Scott Paper Company, Delaware County, Pa.
Filed May 29, 1968, Ser. No. 733,173
Int. Cl. D21h *1/28*
U.S. Cl. 117—155 **3 Claims**

Disclosed is an aqueous paper coating composition having a solids content of at least 70 percent by weight with

said solids being comprised of a coarse ground substantially spherical pigment, a finely divided pigment and coating binder; said coarse ground pigment comprising from 25 to 90 percent of the total pigment content with

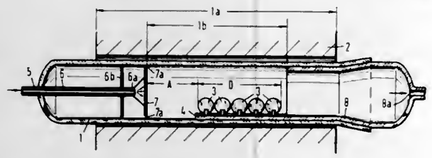


the finely divided pigment comprising the remainder of the pigment composition Also disclosed is a process for applying the new paper coating composition and a glossy coated paper product.

3,578,494
ZINC PLATING BY CHEMICAL REDUCTION
Billy J. Williams and Charles M. Starks, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.
No Drawing. Filed Apr. 9, 1969, Ser. No. 814,797
Int. Cl. C23c *17/02*
U.S. Cl. 117—160 **7 Claims**

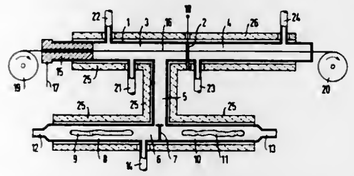
Thin films of zinc can be plated onto substrates at ambient temperatures by first coating the substrate with an organo zinc compound and then contacting the wetted substrate with an aluminum compound having at least one hydrogen bonded directly to the aluminum. The aluminum hydride serves to reduce the zinc compound, and good adhesive thin films of zinc on the substrate are formed.

3,578,495
METHOD OF PRECIPITATING INSULATING PROTECTIVE LAYERS COMPRISED OF INORGANIC MATERIAL UPON THE SURFACES OF SEMICONDUCTOR WAFERS
Erich Pammer, Munich, and Helmuth Kirschner, Unterhaching, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Jan. 13, 1969, Ser. No. 790,725
Claims priority, application Germany, Jan. 15, 1968, S 113,723
Int. Cl. H01l *7/36*
U.S. Cl. 117—201 **9 Claims**



Described is a method of precipitating insulating protective layers of inorganic material at the surface of heated semiconductor wafers from a reaction gas which precipitates the material. The wafers are heated by the reaction chamber wall, comprised of highly pure quartz or similar material. The method is characterized in that the reaction gas which is introduced into the reaction chamber fresh and having a temperature of at least 100° C. below the semiconductor wafers to be coated, is directed by at least one impediment positioned along its path toward the semiconductor wafers to be coated, radially toward the wall of the reaction chamber which has a temperature of at most 50° C. below the temperature of the semiconductor wafers to be coated and then passes quickly to the semiconductor wafers which are located at a distance behind said impediment, that in spite of the now high temperatures of the reaction gas, precipitation takes place only at the location of the seimconductor wafers.

3,578,496
METHOD OF IMPROVING THE SUPERCONDUCTIVITY OF NIOBIUM-TIN LAYERS PRECIPITATED ON A CARRIER
Günther Ziegler, Erlangen, and Barbara Wirth, Altenfurt, near Nuremburg, Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Germany
Filed Mar. 28, 1968, Ser. No. 716,948
Claims priority, application Germany, Mar. 30, 1967, S 109,081
Int. Cl. C23c *11/02;* **H01v** *11/00*
U.S. Cl. 117—227 **6 Claims**



Described is a method of improving the superconductive properties of layers of the intermetallic compound niobium-tin (Nb_3Sn) which are precipitated on a heated carrier by hydrogen reduction of halides of the elements niobium and tin. The method is characterized in that the coated carrier is subjected to a heat processing, under protective gas, which lowers the hydrogen content of the niobium-tin layer.

3,578,497
POTATO STARCH PROPERTIES BY CONTROLLED HEATING IN AQUEOUS SUSPENSION
Erling T. Hjermstad, Cedar Rapids, Iowa, assignor to Penick & Ford, Limited, Cedar Rapids, Iowa
No Drawing. Filed May 19, 1969, Ser. No. 826,026
Int. Cl. C13l *1/08*
U.S. Cl. 127—32 **6 Claims**

Improved paste and gel properties and a higher swelling temperature are imparted to potato starch by heating an aqueous suspension of potato starch at temperatures which are at least initially below the natural gelatinization temperature of the starch, but always below the higher gelatinization temperature attained by the starch due to said heating.

3,578,498
DESOLVENTIZING OF STARCH
Francis E. Kite, Riverside, and Joseph F. Stejskal, Brookfield, Ill., assignors to CPC International Inc., New York, N.Y.
No Drawing. Filed June 12, 1967, Ser. No. 645,528
Int. Cl. C13l *1/08, 1/00, 1/04*
U.S. Cl. 127—71 **12 Claims**

Starch which has been treated with a hydrophilic organic solvent such as a low molecular weight alcohol, ketone, or the like, and which, as a result, retains relatively large quantities of the solvent, is desolventized by contacting it with a hot humid gas, such as, for example, steam or moist air, while maintaining the starch at a temperature of from about 160° F. to about 320° F. and at a moisture level of from about 1% to about 15%. The process is applicable to any type or variety of starch, in either non-gelatinized or pregelatinized form; the process does not alter or otherwise affect the properties of the starch.

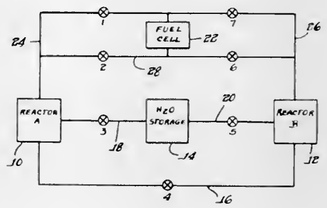
3,578,499
GELLING COMPOSITION FOR GENERAL PURPOSE CLEANING AND SANITIZING
Homer E. Crotty and Charles R. Coffey, Cincinnati, and Thomas C. Tesdahl, Forest Park, Ohio, assignors to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed Aug. 2, 1968, Ser. No. 749,585
Int. Cl. B08b *7/00;* **C11d** *3/48*
U.S. Cl. 134—4 **6 Claims**

The disclosed invention includes a powder gelling composition containing a gelling agent, a neutral diluent, a wetting agent, and desirably a dye or coloring additive. The powder gelling composition when added to water forms a gel. To this gel may be added acid or alkaline materials for cleaning, biocidal agents for sanitizing, or other materials to produce a desired effect. The significant advantage of this method is the increased residence time and hence contact time between agents in the gel and the surface to be acted on.

3,578,500
NONAQUEOUS ELECTRO-CHEMICAL CURRENT PRODUCING CELL HAVING SOLUBLE CATHODE DEPOLARIZER
Donald Leonard Maricle, Ridgefield, and Arthur Kentaro Hoffmann, New Canaan, Conn., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed July 8, 1968, Ser. No. 743,005
Int. Cl. H01m *17/00*
U.S. Cl. 136—6 **9 Claims**

A primary and secondary electrochemical cell which comprises in combination an anode of a metal capable of reducing a cathode depolarizer, sulfur dioxide alone or in a co-solvent, an electrolyte salt, and soluble depolarizers.

3,578,501
FUEL CELL SYSTEM AND METHOD USING LITHIUM AND LITHIUM HYPOCHLORITE TO PRODUCE HYDROGEN AND OXYGEN
Sammy C. Honeycutt, Gastonia, N.C., assignor to Lithium Corporation of America, New York, N.Y.
Filed Nov. 13, 1968, Ser. No. 775,455
Int. Cl. H01m *27/14*
U.S. Cl. 136—86 **9 Claims**

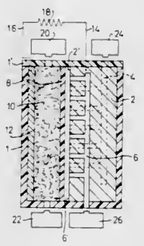


Regenerative hydrogen-oxygen fuel cell system in which gaseous hydrogen and oxygen are separately generated and conveyed to a hydrogen-oxygen fuel cell associated with the system. Hydrogen is generated by the action of water on lithium metal. Oxygen is generated by heating an aqueous solution containing lithium hypochlorite. The system is regenerated by converting the lithium chloride, resulting from the thermal decomposition of lithium hypochlorite, to lithium metal, and by converting the lithium hydroxide monohydrate, obtained from the action of water on the lithium metal, to lithium hypochlorite.

3,578,502
STABILIZED ZIRCONIUM OXIDE ELECTRODE FOR SOLID ELECTROLYTE FUEL CELL
Helmut Tannenberger, Geneva, and Paul Kovacs, Carouge, Geneva, Switzerland, assignors to Compagnie Francaise de Raffinage, Paris, France
Filed July 18, 1968, Ser. No. 760,394
Claims priority, application Switzerland, July 19, 1967, 10,254/67
Int. Cl. H01m *27/04, 27/16*
U.S. Cl. 136—120 **8 Claims**

An electrode has been provided for a solid electrolyte containing fuel cell suitable for high temperature operations, comprising a first porous layer and a second porous layer, said first porous layer comprising at least one layer of granules of a ceramic material capable of conducting oxygen ions and electrons generated in said fuel cell, said granules being in contact with the electrolyte with at least a part of surfaces of said granules, at least a part of other surfaces of said granules being in contact with a material possessing good electron conductivity, said material being in turn in contact with a second porous layer, said second porous layer being a good conductor of electrons and in an electrical contact with said granules, said layers constituting an electrode which in the cell allows the ready access to said granules of fuel or comburant gas.

3,578,503
DEVICES FOR THE ELECTROCHEMICAL GENERATION OF ELECTRICAL CURRENT
Moshe R. Bloch, Chaim Forgacs, and Ronald V. Bobker, Beersheba, Israel, assignors to State of Israel represented by the Prime Minister's Office, Jerusalem, and Dead Sea Works Ltd., Beer Sheva, Israel
Filed Sept. 19, 1967, Ser. No. 668,783
Claims priority, application Israel, Aug. 11, 1967, 28,488
Int. Cl. H01m *17/00*
U.S. Cl. 136—102 **7 Claims**



A fuel cell comprising a cathode system and an anode system disposed in a chamber and separated by a permselective membrane. A liquid catholyte is continuously introduced into and circulated through the catholyte compartment, and an anolyte is continuously introduced into and circulated through the anolyte compartment. The anode system preferably includes a slurry of zinc particles dispersed in a zinc-bromide solution (the anolyte), and the cathode preferably includes a carbon electrode, bromine, and a zinc-bromide solution (the catholyte).

3,578,504
METHOD OF ACTIVATING A SILVER OXIDE-ZINC PRIMARY CELL
Robert P. Hamlen, Scotia, and Elihu C. Jerabek, Delmar, N.Y., assignors to General Electric Company
Filed July 1, 1969, Ser. No. 838,066
Int. Cl. H01m *17/00*
U.S. Cl. 136—102 **2 Claims**

A silver oxide-zinc primary cell is disclosed which comprises a casing, a zinc anode positioned in the casing, a

separator on each side of the anode, a silver oxide cathode on each side of the anode adjacent each separator and spaced from the anode, and magnesium oxide powder contained within the cell. A method is disclosed for activating such a cell which does not contain the magnesium oxide powder which comprises mixing together 5 to 40 weight percent of magnesium oxide powder in an aqueous alkaline electrolyte thereby forming a pourable electrolytic solution, filling the assembled cell with the electrolytic solution, and allowing the viscosity of the solution to increase prior to discharging the cell. A method is also disclosed for forming such a cell wherein magnesium oxide powder is added to the cell during assembly, and the assembled cell is filled with an aqueous alkaline electrolyte prior to use. In both of these methods upon activation of the previously assembled cell, a high viscosity electrolytic solution results thereby preventing silver migration to the anode and other cell components.

3,578,505

PROCESS FOR PREPARING A FUEL CELL ELECTRODE

Edward S. Rogers, Hinsdale, Richard V. Hardin II, Harvey, Benjamin C. Harrison, Hazel Crest, and Robert A. Sanford, Homewood, Ill., assignors to Atlantic Richfield Company

No Drawing. Filed July 8, 1966, Ser. No. 563,685

Int. Cl. H01m *13/00*

U.S. Cl. 136—120 **6 Claims**

A process whereby a catalytically-active metal may be applied to a porous substrate in the preparation of a fuel cell electrode wherein the catalytically-active metal is applied as an aqueous liquid and it is desired to exclude the catalytically-active metal from pores having radii smaller than a predetermined minimum. Particularly, the process comprises blocking the smaller pores with a water-immiscible liquid having a boiling ponit above that of water prior to the treating of the substrate whereby the blocking is accomplished by contacting the porous substrate with the water-immiscible liquid, and then evaporating the water-immiscible liquid from substrate pores having radii larger than the predetermined minimum. The evaporation is conducted so that the water-immiscible liquid remains in substrate pores having radii smaller than the predetermined minimum. Then an aqueous solution of the catalytically-active metal is applied to the porous substrate. Evaporation of the aqueous solution deposits the catalytically-active metal in the substrate pores having radii larger than the perdetermined minimum. Often the porous substrate contains pores of inordinate size and in this case the porous substrate is first treated with an aqueous solution and the largest pores are evacuated. Then the porous substrate is treated with a water-immiscible liquid containing a polymerizable monomer polymerized in said larger pores and decreasing their size accordingly.

3,578,506

SEALING ARRANGEMENT FOR TERMINALS OF ELECTROCHEMICAL GENERATORS

René Chassoux, Talence, France, assignor to Société des Accumulateurs Fixes et de Traction (Société Anonyme), Romainville, France

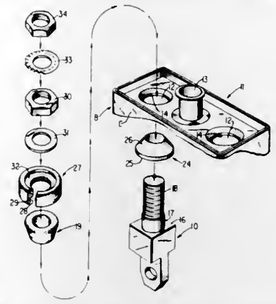
Filed Apr. 7, 1969, Ser. No. 813,885

Claims priority, application France, May 30, 1968, 153,442

Int. Cl. H01m *1/02*

U.S. Cl. 136—168 **15 Claims**

Sealed electrochemical generators and a sealing arrangement for the terminals of electrochemical generators which project outwardly of a metallic cover which provides



effective sealing as well as electrical insulation of the terminals from the metallic cover.

3,578,507

METHOD OF PRODUCING NON-OPAQUE P-TYPE WIDE BAND GAP SEMICONDUCTOR MATERIALS

Kang-rong Chiang, Chicago, Zoltan K. Kun, Skokie, and Robert J. Robinson, Park Ridge, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.

No Drawing. Filed Apr. 28, 1969, Ser. No. 819,962

Int. Cl. H01l *7/62*

U.S. Cl. 148—1.5 **10 Claims**

To produce a non-opaque p-conductivity type wide band gap semiconductor material, a crystalline semiconductor material comprising a zinc chalcogenide is simultaneously doped with zinc atoms and with atoms of a Group V element in non-stoichiometric proportions, with an excess of the Group V atoms. Preferably, the starting material is a hybrid crystalline semiconductor material comprising II–VI compound and III–V compound constituents. P-type conductivity with specific resistivities of 1.0 ohm centimeter or less without opaque darkening is obtained with this process.

3,578,508

TREATMENT OF FERROUS METAL SURFACES TO PREVENT CORROSION

Martin B. Pearlman, New York, N.Y. (78—05 141st St., Flushing, N.Y. 11367)

No Drawing. Filed Apr. 12, 1967, Ser. No. 630,187

Int. Cl. C23f *5/02*

U.S. Cl. 148—6.14 **6 Claims**

Ferrous metal is corrosion-proofed with a solution obtained by treating chromite ore or other oxide with gallic acid. Other chelating agents may replace the gallic acid. The solutions can also be used for the deposition of oxides on inexpensive mineral material to form attrition-resistant supported catalysts.

3,578,509

CONDITIONING FERROUS METAL SUBSTRATES

Bert E. Palm, Mentor, and William Wayne Warner, Painesville, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Filed May 17, 1968, Ser. No. 729,933

Int. Cl. C23f *7/10*

U.S. Cl. 148—6.16 **7 Claims**

To prepare a ferrous metal surface for receiving a hexavalent-chromium-containing coating composition, the surface is first contacted with an aqueous solution having a pH of between about 2–6 and containing up to about 50 weight percent of ammonium dihydrogen phosphate and/or alkali metal dihydrogen phosphate. The resulting contacted surface is then rinsed and may be dried. The solution may also contain, for example, oxidizing ions and surface active agents. After this preparation and the establishment of the above-noted coating, substrates exhibit weldability and enhanced paint adhesion.

3,578,510

CONDITIONING FERROUS METAL SUBSTRATES

Bert E. Palm, Mentor, and William Wayne Warner, Painesville, Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

No Drawing. Filed May 17, 1968, Ser. No. 729,931

Int. Cl. C23f *7/10, 7/26*

U.S. Cl. 148—6.16 **5 Claims**

To prepare a ferrous metal surface for receiving a hexavalent-chromium-containing coating composition there is first established on the surface a partially autogenous, loose dry powder. This powder is formed by contacting the surface with an aqueous solution having a pH below about 2.6 and containing up to about 30 weight percent of an acid of phosphorous and usually 0.25–10 volume percent of surface active agent, and then drying the resulting contacted surface. The solution is typically more acid than a conversion coating solution and weaker in acid strength than a pickling bath. Resulting articles exhibit weldability and enhanced paint adhesion.

3,578,511

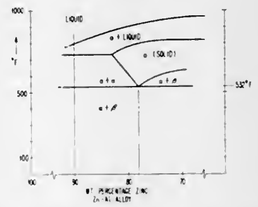
SOLID METAL MOLDING

Daniel L. Mehl, Lexington, Ky., Delbert T. Wilson, Austin, Tex., and Richard J. Young, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 13, 1968, Ser. No. 783,675

Int. Cl. C22f *1/16*

U.S. Cl. 148—11.5 **8 Claims**



The superplastic eutectoid alloy of zinc and aluminum is deformed in a die having a temperature substantially in excess of the critical temperature limit for the alloy without detrimental effect. After forming, the temperature of the resulting part exceeds the critical limit and to thus enable the part to be handled without distortion. In addition, the part temperature after forming is sufficiently high to permit immediate heat treatment for room temperature structural property enhancement as part of the forming cycle simply by controlling the cooling rate of the part.

3,578,512

METHOD OF HEAT TREATMENT OF A STEEL PRODUCT

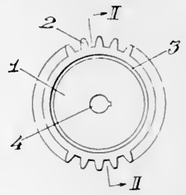
Shinnosuke Funakubo, Tokyo, Japan, assignor to Funakubo Seikyo Kabushiki Kaisha, Tokyo, Japan

Filed May 17, 1968, Ser. No. 730,120

Claims priority, application Japan, May 25, 1967, 42/32,789

Int. Cl. C21d *9/32*

U.S. Cl. 148—147 **6 Claims**



A method of heat-treating and hardening a steel product such as a toothed wheel and similar structural elements, requiring a hardness and abrasion resistance on portions of its working surfaces increased in comparison to the hardness and abrasion resistance of the remaining portions comprising the steps of providing on the surface of said product at least one groove separating the said surfaces of portions of required increased hardness from the remaining surfaces; locally heat-treating the said portions of the surfaces requiring an increased hardness as they are divided by said at least one groove and subsequently hardening by quenching the heat-treated portions leaving the remaining portions with its original hardness and abrasion resistance.

3,578,513

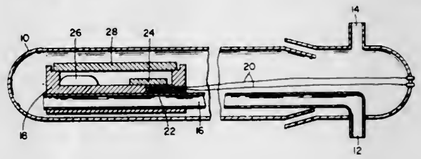
METHOD OF FABRICATING SOLUTION GROWN EPITAXIAL PN-JUNCTIONS IN GALLIUM PHOSPHIDE

Manfred H. Pilkuhn, Braunschweig, Germany, and Max R. Lorenz, Mahopack, N.Y., assignors to the United States of America as represented by the Secretary of the Navy

Filed Sept. 22, 1967, Ser. No. 669,978

Int. Cl. H01l *7/46, 7/00*

U.S. Cl. 148—171 **7 Claims**



The invention is a method of fabricating epitaxial grown p-n junctions from solution and comprises the steps of preparing a gallium phosphide crystal substrate, placing the crystal substrate in one end of a graphite boat, placing a gallium-saturated gallium phosphide solution in the other end of the graphite boat, adding a dopant to the solution, placing the graphite boat in a receptacle, passing a forming gas through the receptacle, heating the receptacle and the graphite boat to about 1140° C. in about 45 minutes, tipping the graphite boat so that the solution covers the substrate, cooling the receptacle and boat to about 700° C. in about 40 minutes and then to near room temperature from about 700° C. by shutting off the heating apparatus, separating the epitaxially overgrown substrate crystal from the mixture, cleaving the crystal at right angles to the overgrowth, etching the cleavage plane, lapping the substrate side of the crystal and alloying ohmic contacts simultaneously on the substrate side and the overgrowth of the crystal.

3,578,514

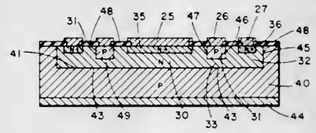
METHOD FOR MAKING PASSIVATED FIELD-EFFECT TRANSISTOR

Israel Arnold Lesk, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Continuation-in-part of abandoned application Ser. No. 368,212, May 18, 1964. This application July 9, 1967, Ser. No. 655,265

Int. Cl. H01l *7/36, 3/00;* **B01j**

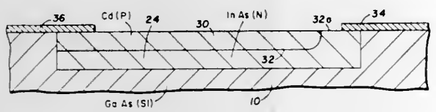
U.S. Cl. 148—175 **5 Claims**



A method of making a field effect transistor in a semiconductor wafer of one conductivity type semiconductor

material which includes initially forming an epitaxial layer of opposite conductivity type semiconductor material on the surface of the wafer to form a first gate PN junction. The epitaxial layer is then coated with a film of diffusion resistant material, and a portion of this film is removed to expose a selected area of the epitaxial layer. An impurity of one conductivity type semiconductor material is then diffused through the exposed area of the epitaxial layer and into the epitaxial layer to a depth less than the first PN junction to thereby form a second gate region of the field effect transistor. This gate region divides the epitaxial layer into source, drain and channel regions of opposite conductivity type semiconductor material. The relatively high resistivity epitaxial channel provides a high gain characteristic and the step of diffusing the second gate provides excellent channel width control.

3,578,515
PROCESS FOR FABRICATING PLANAR DIODES IN SEMI-INSULATING SUBSTRATES
Sebastian Ronald Borrello, Richardson, and Charles Grady Roberts, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Apr. 5, 1967, Ser. No. 628,613
Int. Cl. H01l *3/00, 5/00, 7/34*
U.S. Cl. 148—175 **13 Claims**



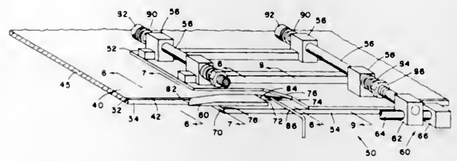
A planar diode comprising a body of p-type indium arsenide (InAs) formed in a pocket in a substrate of semi-insulating gallium arsenide (GaAs) with the faces of the two semiconductors coplanar. A p-type cadmium (Cd) diffused region is formed in only a portion of the indium arsende which extends to one edge of the body of InAs. A first expanded contact is disposed directly on the GaAs substrate and extends onto the p-type Cd diffused region of the InAs body, and a second expanded contact is formed directly on the GaAs substrate and extends onto the InAs body that is still n-type.

The diode is fabricated by selectively etching a pocket in the GaAs substrate through a silicon dioxide (SiO_2) mask, epitaxially filling the pocket with InAs, removing the SiO_2 and lapping the surface of the GaAs substrate and InAs smooth, diffusing Cd through an SiO_2 diffusion mask, and forming the expanded contact by evaporation and photolithographic patterning.

3,578,516
HIGH ENERGY FUEL COMPRISING BERYLLIUM HYDRIDE AND PENTABORANE
Robert N. Sanders, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.
No Drawing. Filed Aug. 6, 1968, Ser. No. 752,731
Int. Cl. C06b *21/00*
U.S. Cl. 149—22 **10 Claims**

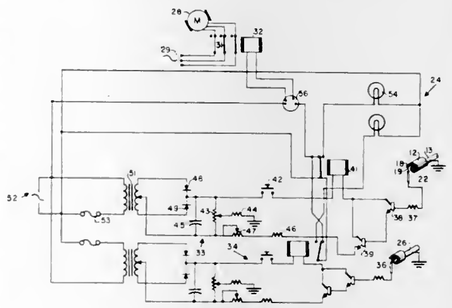
Heterogeneous compositions, stable against sedimentation, are made by suspending an insoluble solid component in a liquid mixture of two components, one more and the other less dense than the solid component, in such proportions that the density of the liquid mixture approximates closely that of the solid component. Exemplary compositions are suspensions of beryllium hydride in (1) 82 volume percent pentaborane, 18 volume percent trimethylaluminum, and (2) 93 volume percent pentaborane, 7 volume percent decaborane.

3,578,517
GYPSUM BOARD FORMING
Leon R. Lapp and Edward A. Burkard, East Amherst, N.Y., assignors to National Gypsum Company, Buffalo, N.Y.
Filed Aug. 26, 1968, Ser. No. 755,149
Int. Cl. B32b *13/04*
U.S. Cl. 156—40 **10 Claims**



A method and machine for forming wrapped edges of paper-enclosed gypsum board, wherein the bottom cover sheet side edges are folded upward and inward, underlapping the side edges of the top cover sheet, and containing therewithin the unset gypsum slurry. The contacting surfaces of the lapped edges are kept clean and free of adhesive until forming is complete, after which they are slightly separated, a contact adhesive is applied and they are then firmly adhered, one to another.

3,578,518
METHOD AND APPARATUS FOR MONITORING THE BONDING OF PAPER-WRAPPED WIRE
Alvin L. Gregg and Charles E. Koons, Harrisonville, Mo., assignors to Anaconda Wire and Cable Company
Filed June 27, 1968, Ser. No. 740,563
Int. Cl. H01b *13/10*
U.S. Cl. 156—64 **4 Claims**

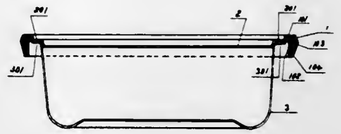


In a device for applying adhesive to the longitudinal edge of a paper tape being wrapped around an advancing wire, interruptions in adhesive flow to the tape are sensed from a decrease in electrical conductivity at a point immediately downstream of the applicator.

3,578,519
PROCESS FOR THE ASSEMBLY OF SHEETS AND APPARATUS FOR SAME
Bernard Baumann, Paris, France, assignor to L'Aluminium Francais, Balzac, France
Continuation-in-part of abandoned application Ser. No. 503,842, Oct. 23, 1965. This application Mar. 10, 1969, Ser. No. 816,143
Int. Cl. B65b *7/00*
U.S. Cl. 156—69 **8 Claims**

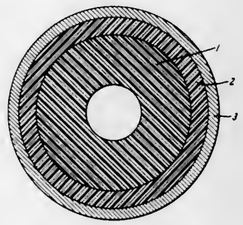
A system for joining flat portions of sheets with a joint blank formed of thermoplastic material. The joint

blank initially defines first and second flat sides extending substantially perpendicularly one from the other. One flat side is disposed in overlying relationship with the flat edge portions of the sheets and the other side in overhanging relationship with respect to the flat edge



portions. A rotating roller die is provided for engagement with the overhanging portion of the joint blank, and the roller die is gradually displaced for deforming the overhanging portion for molding this portion into engagement with the flat edge portions of the sheets.

3,578,520
THERMAL INSULATION AND BOND FOR SOLID FUEL MOTORS AND METHOD OF MAKING SAME
Calvin M. Dolan, King of Prussia, and John S. Axelson, Levittown, Pa., assignors to General Electric Company
Original application Oct. 10, 1966, Ser. No. 588,003, Divided and this application July 17, 1968, Ser. No. 745,638
Int. Cl. B32b *5/20*
U.S. Cl. 156—79 **7 Claims**



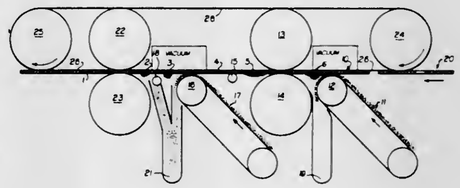
Improved means for bonding a rocket propellant grain to its casing and thermally insulating the grain from the casing comprises the interposition between the grain and casing of a room-temperature curing and foaming elastomeric material with char retention additives. The preferred elastomeric materials are silicones and silicone epoxies. Generally, a thin layer of the insulative-adhesive foaming material is first applied either to the outer surface of the preformed rocket grain or to the inner surface of the rocket grain casing. The grain and casing are then assembled and the elastomer is allowed to foam, filling the space between the rocket grain and the casing.

3,578,521
METHOD FOR MAKING FILM CLAD PANELS
Wayne Evans, Raytown, Mo., assignor to Butler Manufacturing Company, Kansas City, Mo.
Filed July 26, 1967, Ser. No. 656,209
Int. Cl. B32b *31/06*
U.S. Cl. 156—84 **3 Claims**

An improvement in the continuous method of fabricating polyvinyl fluoride clad fiber reinforced plastic panels wherein fine wrinkles in the surface of the panels resulting from variations in shrinkage characteristics are removed by subjecting the film to infrared heat after ini-

tiation of cure of the plastic and prior to final forming and cure.

3,578,522
VENEER DEFECT FILLING METHOD
August H. Rauch, Lebanon, Oreg., assignor to U.S. Plywood-Champion Papers Inc., New York, N.Y.
Filed July 6, 1966, Ser. No. 563,268
Int. Cl. B32b *19/08, 35/00*
U.S. Cl. 156—94 **8 Claims**

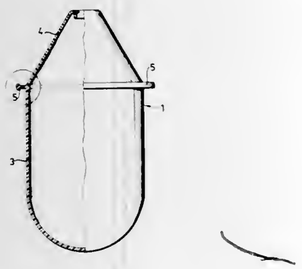


The present invention and apparatus covers a two-stage method for patching surface discontinuities in wood panels such as veneers and the like. In an initial stage, aggregate is added to the discontinuity by means of a vacuum. The aggregate is then compacted. In a second stage additional aggregate is added in the voids of the aggregate added in the initial stage by imposing a vacuum through said voids.

3,578,523
EXTRUSION MOLDING OF PARTICLE BOARD HAVING PARTICULAR SURFACE CHARACTERISTIC
Georg Ohse, Neuenbeken, Paderborn, Germany, assignor to Alfred Graf zu Erbach-Furstenau, Schloss Furstenau, Michelstadt, Germany
Filed May 18, 1967, Ser. No. 639,492
Claims priority, application Germany, May 21, 1966, E 23,490, E 31,712
Int. Cl. B32b *31/08*
U.S. Cl. 156—164 **16 Claims**

Particled board made by extrusion moulding, in which the chips located adjacent to the surfaces of the board are oriented or bent into a plane substantially parallel to the plane of the board to produce isotropic strength characteristics.

3,578,524
PROCEDURE DURING THE PRODUCTION OF A PACKAGING CONTAINER COMPRISING AN OUTER SLEEVE AND A LINING WITH AN OUTWARD-TURNED FLANGE
Rolf Lennart Ignell, Lund, Sweden, assignor to Sobrefina SA, Fribourg, Switzerland
Filed Oct. 16, 1967, Ser. No. 675,540
Claims priority, application Sweden, Nov. 18, 1966, 15,788/66
Int. Cl. B32b *1/10*
U.S. Cl. 156—196 **2 Claims**

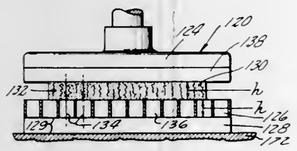


A method for forming a container having an inner liner with a radial flange extending outwardly therefrom adjacent its upper portion and being inserted in a sleeve up to the flange and the flange being folded down about the sleeve to secure the sleeve and liner together.

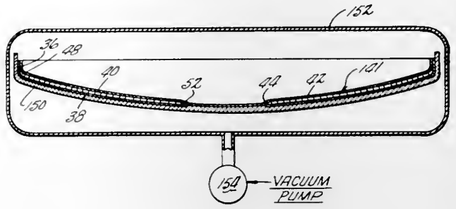
3,578,525
METHOD OF MARKING TEXTILE ARTICLES
Roger Mueller, Syracuse, N.Y., assignor to Textile Marking Machine Co., Inc., Syracuse, N.Y.
Filed June 5, 1968, Ser. No. 742,112
Int. Cl. B41m *3/00*
U.S. Cl. 156—238 **3 Claims**

A dry transfer is applied to the textile article by a heating iron and simultaneously, additional indicia is printed on the article by selected type fixedly located relative to the iron. The transfers are provided at areas spaced along a carrier strip and print ink is provided on the same strip, or on another strip. By using interchangeable type, any form of additional indicia may be printed on the article simultaneously with the application of the transfer thereto.

3,578,526
METHOD OF MAKING REINFORCED HONEYCOMB SANDWICH
Howard H. Harding, Bridgeport, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Jan. 22, 1968, Ser. No. 701,528
Int. Cl. B29c *27/00*
U.S. Cl. 156—242 **23 Claims**



A lightweight, sandwich construction comprising a honeycomb core member with end-grain balsa wood impressed thereinto to fill the cells thereof at selected positions for the purpose of strengthening the honeycomb for machining or load carrying such as bolt retention and preferably including plastic impregnated fiber glass sheets adhesively bonded to the opposite sides of the end-grain



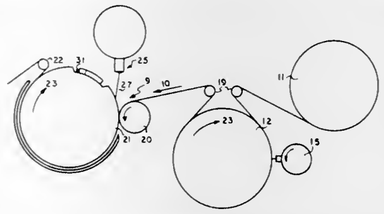
balsa wood impressed honeycomb core to form a sandwich construction thereof and the method of so fabricating such sandwich construction.

3,578,527
METHOD OF PRODUCING A LAMINATED ARTICLE EMPLOYING EXTRUSION AND AN INERT GAS
Rikita Sakata, Kohei Masuda, Taku Uchigaki, and Masakazu Arai, Yokkaichi-shi, Japan, assignors to Mitsubishi Petrochemical Industry Co., Ltd., Tokyo, Japan
Filed Mar. 11, 1968, Ser. No. 712,113
Claims priority, application Japan, Mar. 10, 1967, 42/14,921
Int. Cl. B29c *23/00*
U.S. Cl. 156—244 **17 Claims**

A method for producing composite laminated articles by extruding a thin film of melted resin such as polyethylene, polypropylene, and the like, onto a base material such as paper, metallic foil and the ilke, the melted resin being extruded at its oxidizing temperature whereby the surface opposite to the surface to be bonded to the base material of the extruded film is covered by inert gas while the bonding surface is oxidized by the air such that the non-bonding surface is prevented from being oxidized by the air. By this method, a laminated composite article having superior adhering properties between the resin film and the base and having superior heat sealing properties, without offensive odors, is obtained.

Apparatus for carrying out the above-mentioned method wherein means providing an apparatus for issuing inert gas is provided adjacent to the mouth piece of the resin extruder.

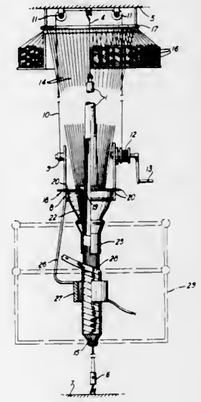
3,578,528
APPARATUS FOR FORMING HANDLES ON PAPER BAGS
Peter Weisshuhn, 204—1985 Bellevue Ave., Vancouver, British Columbia, Canada
Filed May 9, 1967, Ser. No. 642,999
Int. Cl. B29c *23/00*
U.S. Cl. 156—380 **9 Claims**



Apparatus and method for forming handles on paper bags wherein a running paper web, partially severed transversely at intervals, is passed together with an extruded

sheet of thermo-plastic material in a flowing condition, through a nip between a chilling roller and pressure roller—thus effecting a bond. The chilling roller has depressions formed in its surface which provides unbonded thermo-plastic sections overlying lines of partial severance of the paper web so that when the web is completely severed at said intervals the unbonded sections of thermo-plastic material form bag handles.

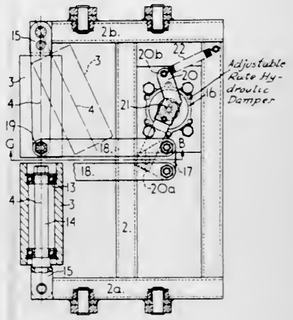
3,578,529
APPARATUS FOR PRODUCING REINFORCED PLASTICS MATERIAL ARTICLES
Arthur Kenneth Baker, Woodlands, Cut-a-Thwart Lane, Woodham Walter, Maldon, Essex, England
Filed May 27, 1968, Ser. No. 732,211
Int. Cl. B32b *23/02*
U.S. Cl. 156—393 **6 Claims**



The invention is particularly applicable to the production of comparatively long hollow reinforced tubular components such as tapering masts or spars, the invention covering an apparatus comprising a carrier for spools of strands of reinforcing material, means for uniformly distributing and laying said strands progressively longitudinally on a former or shell whilst the latter is supported in a vertical position, a bath for containing synthetic resin surrounding said former or shell and through which said strands are adapted to pass during laying and thus become impregnated with resin, said bath at its lower end including a tubular resilient neck portion adapted to fit closely around said strands as they are laid on said shell or former to consolidate said strands and control the resin content and means for moving said bath vertically upwardly throughout the length of said shell or former until the laying process is completed.

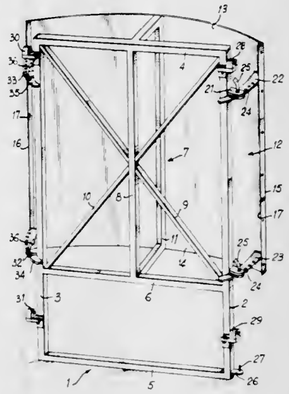
3,578,530
ARRANGEMENT FOR CONSOLIDATING TIRE BUILDING COMPONENTS
Ernest G. Nicholls, Balsall Common, near Coventry, England, assignor to The Dunlop Company Limited, London, England
Filed Mar. 8, 1968, Ser. No. 711,725
Claims priority, application Great Britain, Mar. 17, 1967, 12,612/67
Int. Cl. B29h *17/18*
U.S. Cl. 156—410 **6 Claims**

A device for consolidating tire building components e.g. breakers, tread strips, on to a shaped carcass comprising a pair of freely rotatable rollers, pivotally mounted on a framework, and locatable symmetrically with respect to the mid-circumferential plane of the carcass. In use the framework, and hence the rollers, are resiliently urged against the component on the carcass so that the axes of rotation of the rollers tilt gradually about the pivotal



mounts and successive parts of the roller peripheries engage with the parts of the component at gradually increasing distances from the mid-circumferential plane.

3,578,531
MANDREL
Dominique Carlini, Rousset, France, assignor to Recherches et Applications des Plastiques dans l'Industrie et le Batiment, S.A., Rousset, France
Filed Apr. 25, 1968, Ser. No. 723,986
Claims priority, application France, Aug. 17, 1967, 118,049
Int. Cl. B65h *67/00, 81/00, 81/02*
U.S. Cl. 156—425 **10 Claims**

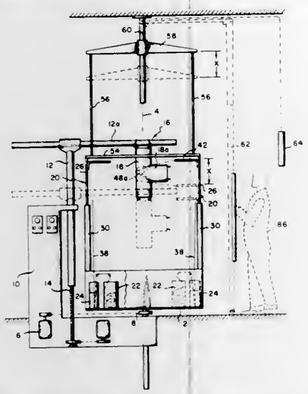


A cylindrical mandrel comprised of a plurality of segments, the arc transcribed by each segment being adjustable to vary the circumference of the mandrel. The mandrel segments comprise frame members which support, from the center thereof, flexible rectangular blanks and means are provided for adjusting the bending of the blanks.

3,578,532
WINDING APPARATUS FOR FORMING T-SHAPED FITTINGS
Herbert V. Thaden, 1101 N. Main St., High Point, N.C. 27262
Filed Nov. 4, 1968, Ser. No. 772,924
Int. Cl. B65h *81/02;* **B31c** *1/00*
U.S. Cl. 156—431 **8 Claims**

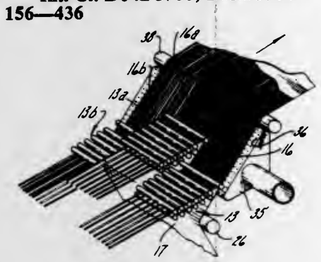
Winding apparatus for forming T-shaped fittings from continuous resin-impregnated glass fiber stock, characterized in that means are provided for winding "figure 8"

turns about the crotch areas between the stem and arm portions of a T-shaped mandrel. In accordance with the invention, first control means are provided for vertically displacing the mandrel relative to the continuously driven



winding table, and second control means serve to vertically adjust the roving guide means relative to winding table, whereby an improved structurally strengthened T-shaped object is produced.

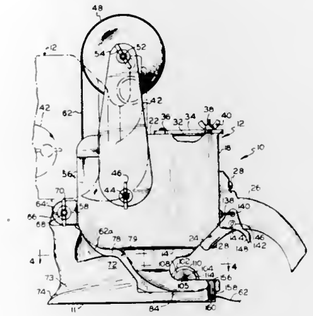
3,578,533
APPARATUS FOR DRAFTING AND DEPOSITING MULTIPLE FIBER WEBS ON A CARRIER SHEET
James Loynd, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed June 23, 1969, Ser. No. 835,630
Int. Cl. D04h *3/00;* **B65h** *5/04*
U.S. Cl. 156—436 **5 Claims**



An apparatus for forming a non-woven material including a web of highly-drafted fibers and a layer of cellulosic wadding is disclosed. The wadding sheet is printed with a spaced pattern of adhesive and moved along a path disposed to intersect the discharge path of the drawn web. A vacuum is drawn through the wadding sheet opposite the point of fiber impingement to pull the highly-drafted fibers against the sheet and partially embed the fibers in the adhesive. The wadding sheet may be substantially wider than the web of highly-drafted fibers and multiple draw frames are provided with adjacent ones of the draw frames disposed in laterally offset and vertically staggered relation such that adjacent webs are successively deposited on the sheet in substantially abutting side-by-side relation.

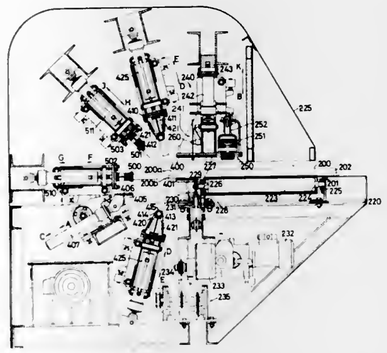
3,578,534
CARPET SEAMER
Leo R. Johnson, 7026 NE. Grand Ave., Portland, Oreg. 97211
Filed Aug. 30, 1968, Ser. No. 756,527
Int. Cl. B31f *5/06*
U.S. Cl. 156—461 **13 Claims**

An apparatus for seaming carpets face-up on the floor having a support for a roll of carpet tape, means for folding the tape along a longitudinal centerline thereof, and means for feeding the tape to the underside of two abutting pieces of carpet lying face-up on the floor, whereby the tape and the carpet are in position for the carpet to be



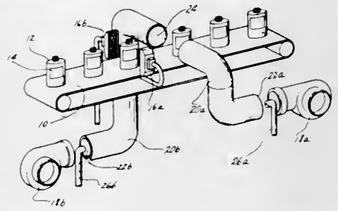
seamed by being subsequently adhered to the tape. The apparatus also includes a receptacle for adhesive together with means to spread the adhesive uniformly across the width of the tape.

3,578,535
MACHINE FOR FOLDING EDGES OF A PLASTICS SHEET FACING ABOUT A DOOR PANEL, OR THE LIKE
Gerhard Göhlfennen, Imstiege 10, and Roland Spicka, Bahnhofstr. 13, both of Gildehaus, Germany
Filed July 22, 1968, Ser. No. 746,549
Claims priority, application Germany, July 22, 1967, G 50,720; Nov. 7, 1967, P 16 25 549.5; July 3, 1968, P 17 79 066.8
Int. Cl. B65c *9/36;* **B30b** *15/34*
U.S. Cl. 156—493 **13 Claims**



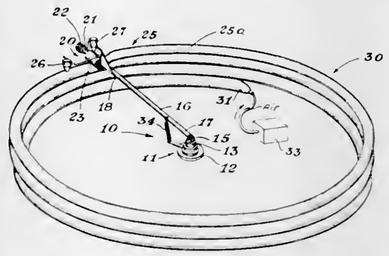
A machine for applying plastics sheet material facing to a door panel or the like, in which the door panel is advanced on a table where mechanism operates first to align it, and then other mechanism clamps it firmly in place, bears for the clamping device being guided between parallel guide members. Thereafter, presses in the form of gas-filled flexible tubes apply pressure to the facing material at the corners. Sequentially, tools apply the facing material to other parts of the door, including the rabbeted edge portion. Finally the clamping device is released to enable the finished door panel to make way for an unfinished door panel.

3,578,536
APPARATUS FOR CURING LABELS
Arthur C. Peck, Hazardville, and Alexander J. Usko, Wapping, Conn., assignors to Monsanto Company, St. Louis, Mo.
Original application Nov. 21, 1966, Ser. No. 595,796, now Patent No. 3,510,341, dated May 5, 1970. Divided and this application Apr. 24, 1969, Ser. No. 841,172
Int. Cl. B32b *31/20*
U.S. Cl. 156—497 **2 Claims**



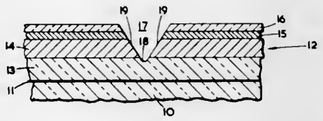
This invention is directed toward glossing the surface of wax release decals on plastic containers by shock melting the wax without appreciably raising the temperature of the plastic, in order to smooth the wax, followed by immediate shock chilling of the heated surface to maintain the gloss.

3,578,537
APPARATUS FOR THE PREPARATION OF WALLED STRUCTURES
Donald R. Wright, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Sept. 25, 1967, Ser. No. 670,055
Int. Cl. B44c *7/02;* **E04b** *1/345*
U.S. Cl. 156—577 **7 Claims**



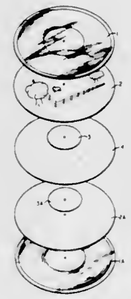
A structure is prepared by the spiral generation technique employing a flattened plastic tube which is inflated by means of internal fluid pressure and deposited in a generally helical manner. Adjacent turns of the helix are adhered to each other to provide a walled structure.

3,578,538
LAMINATED INDICATOR PLAQUES
Kenneth Wheatley Prosser and John Vipond Wallace, Luton, England, assignors to The English Electric Company Limited, London, England
Filed June 12, 1968, Ser. No. 736,380
Claims priority, application Great Britain, June 15, 1967, 27,650/67
Int. Cl. B32b *3/10;* **G09f** *13/06, 13/08*
U.S. Cl. 161—6 **15 Claims**



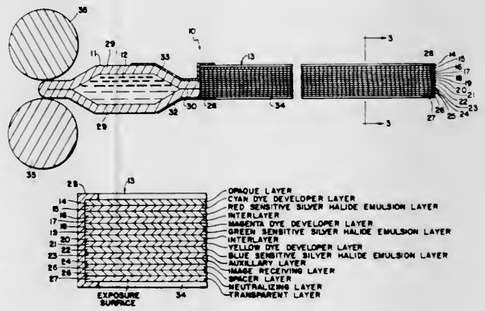
A laminated indicator plaque has V-shaped indicia cut through an opaque layer and into a translucent layer so that light from a source behind the translucent layer is reflected from the walls of the indicia in the opaque layer.

3,578,539
PICTURE RECORDS
Alec Lash, Corner House, York St., Sydney, New South Wales, Australia
Filed July 5, 1968, Ser. No. 742,546
Claims priority, application Australia, July 19, 1967, 24,769
Int. Cl. G11b *3/84;* **B29d** *17/00*
U.S. Cl. 161—6 **10 Claims**



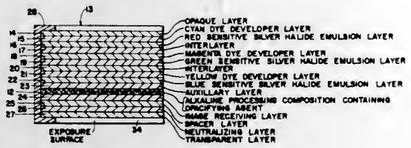
This application discloses the construction of a picture record being a musical or sound recording disc having a transparent playing surface superimposed over a paper disc bearing a picture, design and/or printed matter visible through the transparent playing surface and a method of manufacturing such picture records with avoidance of damage to the paper discs bearing a picture or other indicia.

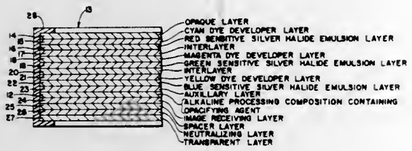
3,578,540
COLOR PHOTOGRAPHIC PRODUCT FORMED BY DIFFUSION TRANSFER
Edwin Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Continuation-in-part of application Ser. No. 622,283, Mar. 10, 1967. This application July 22, 1968, Ser. No. 746,554
Int. Cl. B44f *1/00;* **G03c** *5/54*
U.S. Cl. 161—6 **8 Claims**



A laminated photographic product including an image-containing layer protectively sandwiched between outer support layers and formed by utilizing an integral film unit including a photosensitvie image-recording medium and a liquid reagent for processing the recording medium

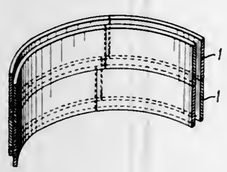
following exposure thereof to produce a visible image and laminate said layers to one another to form an integral unit. The product is especially designed to resist





distortion due to physical changes, particularly the quantity and distribution of moisture in laminae comprising the product.

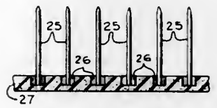
3,578,541
THERMALLY INSULATED RECEPTACLE FOR A CRYOGENIC FLUID
Henri Tariel, Grenoble, France, assignor to L'Air Liquide Anonyme pour L'Etude et l'Exploitation des Procedes Georges Claude
Filed Dec. 16, 1966, Ser. No. 602,324
Claims priority, application France, Nov. 2, 1966, 82,152
Int. Cl. B32b *3/26, 5/18;* **B65d** *81/38*
U.S. Cl. 161—7 **3 Claims**



Cryogenic insulation is provided, comprising Klegecell G300, which is foamed plastic formed from polyvinyl chloride, a copolymer of a vinylidene monomer and an ethylenically unsaturated carboxylic acid anhydride, and a polyisocyanate having at least two —N=C=O groups per molecule. It is impervious to atmospheric gases and thus protects the insulation. It can be used in combination with superinsulation, and can be covered with a protective and/or ablative coating.

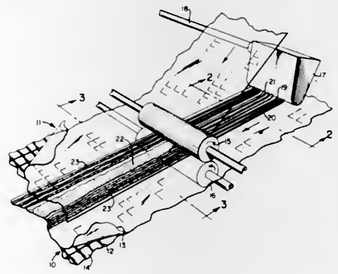
3,578,542
SIMULATED GRASS MAT FOR DRIVING GOLF BALLS
Steven Migitz, 17 Whistler Hill Lane, Huntington, N.Y. 11743
Filed Oct. 21, 1968, Ser. No. 769,183
Int. Cl. A41g *1/00*
U.S. Cl. 161—21 **9 Claims**

A simulated grass mat having substantially perpendicularly extending blades or stems wherein the blades are anchored in a cavity so that they bend and deflect the head of a golf club rather than being sheared off;



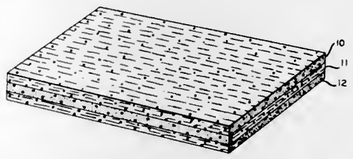
the material of the mat being selected to simulate normal turf.

3,578,543
SEAL FOR PLASTIC SHEETING
Charles A. Cook and David H. Campbell, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.
Filed Sept. 28, 1967, Ser. No. 671,263
Int. Cl. B32b *3/22*
U.S. Cl. 161—38 **5 Claims**



An overlap seal for joining together two edges of reinforced thermoplastic material. A plurality of strands or bands of hot melt adhesive are applied adjacent the edge of the one sheet of thermoplastic reinforced material and the edge of another sheet is positioned above the first sheet. The sheets are brought together and pressure is applied so that the heat contained in the hot melt adhesive causes a fusion of the two edges of thermoplastic to create a high strength bond. Some of the bands of thermoplastic material flow together to form a wide band with narrower bands on each side to provide an overlapped seal having increased strength.

3,578,544
REINFORCED MICROPOROUS LAMINATES
Agmund K. Thorsrud, Brussels, Belgium, assignor to Phillips Petroleum Company
Filed Jan. 18, 1968, Ser. No. 698,831
Int. Cl. B32b *5/12, 5/18*
U.S. Cl. 161—59 **6 Claims**

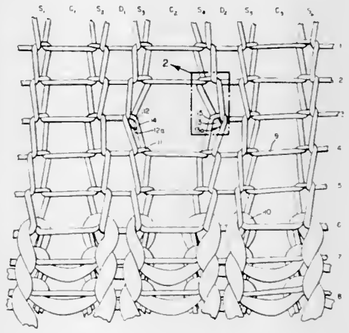


A reinforced microporous sheet is formed by distributing fibers and blowing agent in a softened elastomeric or thermoplastic material, forming a sheet of material having unidirectionally oriented fibers, laminating two or more sheets such that the fibers in each sheet are at an angle to those in adjacent sheet(s), and foaming during or subsequent to the preparation of the sheet or laminate.

3,578,545
FLEXIBLE ODOR-LIBERATING LAMINATE
Richard M. Carson and Reuben R. Saeks, Dayton, Ohio, assignors to Carson-Saeks, Inc., Dayton, Ohio
No Drawing. Continuation-in-part of application Ser. No. 433,991, Feb. 19, 1965. This application Aug. 19, 1968, Ser. No. 753,704
Int. Cl. A61l *9/04*
U.S. Cl. 161—86 **8 Claims**

The present invention relates to laminates of flexible, transparent, porous plastic films to which is cemented absorbtive fabric or felt impregnated with an odoriferous material, such as a perfume, which slowly passes through the pores of the plastic film thus giving objects in contact therewith an agreeable odor over relatively long periods of time.

3,578,546
SPANDEX FABRIC AND METHOD OF MAKING THE SAME
William F. Morancy, Cumberland, R.I., assignor to Lawson Products, Inc., Pawtucket, R.I.
Filed Apr. 28, 1967, Ser. No. 634,535
Int. Cl. B32b *5/04, 7/04*
U.S. Cl. 161—89 **9 Claims**



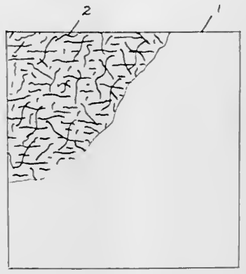
Fabric having concatenated loops of spandex yarn and of at least one other yarn is made non-run and given true shape stability without loss of elasticity, stretchability, flexibility and fitability, by being autoclaved in the presence of steam to produce fusion between contacting portions of the spandex yarn only.

ERRATUM

For Class 161—102 see:
Patent No. 3,578,173

3,578,547
LAMINATED FIBER-REINFORCED SHEET OF POLYMERIC MATERIAL
George Leonard Wicker, Lancashire, England, assignor to Turner Brothers Asbestos Company Limited, Manchester, England
Application June 15, 1965, Ser. No. 464,149, now Patent No. 3,461,012, dated Aug. 12, 1969, which is a continuation-in-part of abandoned application Ser. No. 237,195, Nov. 13, 1962. Divided and this application Apr. 28, 1969, Ser. No. 819,631
Claims priority, application Great Britain, Nov. 13, 1961, 40,520/61; June 15, 1964, 24,749/64
Int. Cl. B32b *5/16*
U.S. Cl. 161—156 **6 Claims**

A rigid sheet of a polymeric material having loose fibers dispersed throughout the sheet and randomly oriented and predominantly lying in the plane of the sheet is produced by feeding a homogeneous dough-like mass formed from a solution or emulsion of the polymeric material and the



loose fibers into the nip between two calender bowls, one of which is heated, and building the material up in laminations on one of the bowls.

3,578,548
PREFORMED RESINOUS COVERINGS ADHERED TO ARCHITECTURAL SURFACES
George L. Wesp, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed July 14, 1969, Ser. No. 842,086
Int. Cl. B32b *3/12, 27/08, 27/30*
U.S. Cl. 161—160 **15 Claims**

A resinous covering material is adhered to a surface with a pressure-sensitive adhesive which, upon contact after drying, develops an immediate bond of high cohesive strength between the surface and the covering that becomes a permanent moisture-resistant bond. The adhesive compositions comprise a latex and a transient tackifier which comprises an epoxy resin and a curing agent. Some adhesive compositions may be foamed to provide a conformable smooth supporting surface for a high modulus preformed resinous covering. The architectural surface, preformed resinous covering and pressure-sensitive adhesive containing a transient tackifier comprise a used architectural surface composite for residential and commercial installations.

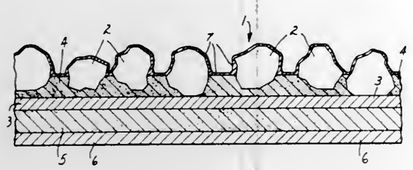
3,578,549
EXPANDABLE PLASTIC ARTICLES
Kenneth J. Cleereman and Lowell S. Thomas, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
Original application Aug. 26, 1966, Ser. No. 575,282. Divided and this application Nov. 24, 1969, Ser. No. 877,594
Int. Cl. B32b *3/02, 5/18*
U.S. Cl. 161—160 **8 Claims**

Expandable synthetic resinous sheets are provided which have major expansion in only one direction. The limited expansion is obtained by employing axially oriented sheets.

3,578,550
FOIL-BACKED NON-SKID SHEET
Alfred J. Hoerner, St. Paul, and George M. Seiter, Golden Valley Village, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Jan. 31, 1969, Ser. No. 795,455
Int. Cl. B32b *5/16;* **C09j** *7/02*
U.S. Cl. 161—162 **8 Claims**

Foil-backed non-skid sheet material suitable for installation on rough, irregular, and curved surfaces with

which it maintains intimate contact over extended periods of time. An "open coat" single layer of frictional particles is adhered in a regular manner to an annealed aluminum



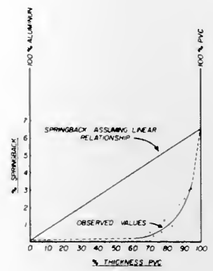
foil backing by a flexible, elastoplastic, silane-containing polyurethane binder. The rear face of the foil is coated with a normally tacky and pressure-sensitive adhesive.

3,578,551
SPLITTABLE TOW
Jack N. Gray, Columbia, S.C., and George A. Watson, Davidson, N.C., assignors to Celanese Corporation and Fiber Industries, Inc., both of New York, N.Y.
Original application July 13, 1964, Ser. No. 382,017, now Patent No. 3,439,394, dated Apr. 22, 1969. Divided and this application Apr. 18, 1969, Ser. No. 817,508
Int. Cl. D02g *3/00*
U.S. Cl. 161—173 **5 Claims**

A crimped tow comprising a ribbon of crimped parallel continuous filaments readily splittable by pulling opposite sides of the band.

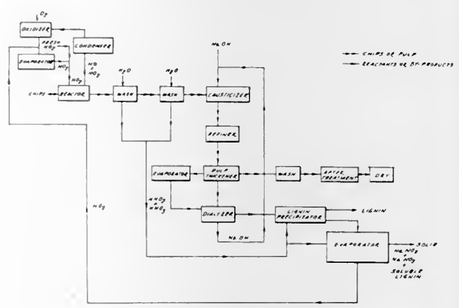
3,578,552
THERMOSETTING LAMINATES
Dusan C. Prevorsek, Morristown, Hsin L. Li, Parsippany, Paul J. Koch, Mount Freedom, Hendrikus J. Oswald, Morristown, and George J. Schmitt, Madison, N.J., assignors to Allied Chemical Corporation, New York, N.Y.
Continuation-in-part of application Ser. No. 604,255, Dec. 23, 1966. This application Apr. 4, 1968, Ser. No. 718,858
Int. Cl. B32b *15/08, 27/36, 27/40*
U.S. Cl. 161—214 **9 Claims**

A cold formable sandwich structure which has a thermosetting resinous core between face sheets comprising laminae of a thermoplastic sheet which incorporates a metallic foil. The metal foil-thermoplastic resin facing sheets are of sufficient thickness and strength so that the sandwich containing the thermosetting core between the face sheets may be cold-formed into shaped articles and such shape as is imparted to it is retained by the thermo-



plastic face sheets without external constraint on the shape as the thermosetting core is subsequently cured at relatively high temperatures.

3,578,553
NITROGEN DIOXIDE PULPING PROCESS
Madhu P. Godsay and Donald M. MacDonald, Hawkesbury, Ontario, Canada, assignors to Canadian International Paper Company, Montreal, Quebec, Canada
Filed Sept. 10, 1968, Ser. No. 758,841
Int. Cl. D27c *3/16*
U.S. Cl. 162—14 **9 Claims**

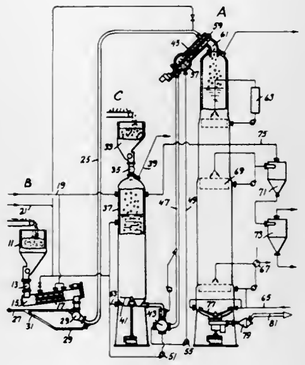


A primary pulping process in which raw ligno-cellulosic material is contacted with nitrogen dioxide gas at atmospheric pressure and ambient temperature to produce cellulosic pulp and useful by-products, for example lignin nitrates and nitrites, without air or other pollution.

3,578,554
METHOD FOR COMMON DIGESTION OF TWO DIFFERENTLY PRE-TREATED FRACTIONS OF WOOD CHIPS
Johan C. F. C. Richter, St. Jean Cap Ferrat, France, assignor to Aktiebolaget Kamyr, Karlstad, Sweden
Filed Sept. 18, 1968, Ser. No. 760,486
Claims priority, application Sweden, Sept. 18, 1967, 12,803
Int. Cl. D21c *3/26*
U.S. Cl. 162—19 **2 Claims**

A continuous digester is charged with wood chips divided by screening into two fractions, viz a larger fraction of coarser particles and a smaller fraction of finer

particles. The fractions are digested in common but are pre-treated differently. The pre-treatment of the coarser fraction consists in steaming and thorough impregnation with digesting liquor, and the pre-treatment of the finer fraction consists in merely steaming or steaming and im-



pregnation during a shorter time. The two fractions are conveyed to the digester top in different ways, the coarser chips being suspended in circulating liquid, and the finer chips may be blown by steam, preferably steam later used for heating the digester to digesting temperature.

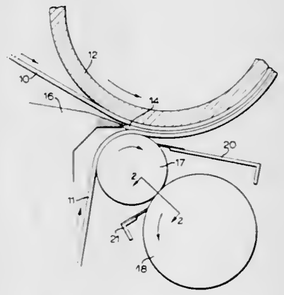
3,578,555
SILICONE-ALUM TREATMENT OF PERLITE FIBER INSULATION BOARD AND PRODUCT THEREOF
Otto A. Oshida and Jon P. Gilmore, Albuquerque, N. Mex., assignors to Grefco, Inc., Philadelphia, Pa.
No Drawing. Filed Dec. 12, 1968, Ser. No. 783,434
Int. Cl. D21h *3/36*
U.S. Cl. 162—164 **8 Claims**

A high degree of water repellency is conferred on perlite-cellulose fiber insulation board by uniformly incorporating both a silicone and an acid aluminum salt in the aqueous board forming mix.

3,578,556
VERTICAL PAPER MACHINE WHEREIN STOCK IMPINGES WIRES BELOW THE BREAST ROLLS
Willard C. Notbohm and Paul M. Schaffrath, Watertown, N.Y., assignors to The Black Clawson Company, Hamilton, Ohio
Filed Aug. 27, 1968, Ser. No. 755,602
Int. Cl. D21f *1/06*
U.S. Cl. 162—203 **9 Claims**

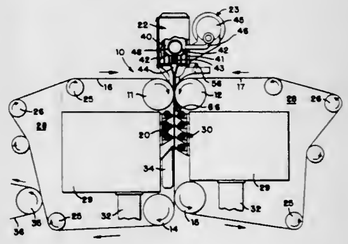
In a two-wire vertical paper machine, opposed downwardly traveling reaches of the two wires are guided in converging relation to define a forming zone of predetermined dimensions, and a free standing sheet-like stock jet of a thickness less than the width of the mouth of the forming zone is delivered into the forming zone in such manner that it does not impinge on either of the wires until it reaches a level sufficiently below the breast rolls to avoid their pumping action. The relative speeds of the wires and the stock jet are regulated to produce desired characteristics in the paper sheet i.e., such as the ratio of tear strength in the cross machine direction to the machine direction.

3,578,557
SUPPORT STRUCTURE FOR FOURDRINIER WIRE ADJACENT THE HEADBOX CONSISTING OF A SMALL DIAMETER ROLL SUPPORTED BY A LARGER DIAMETER MASTER ROLL
Gordon Thomas Tidbury, Beaconsfield, Quebec, Canada, assignor to Dominion Engineering Works, Limited, Lachine, Quebec, Canada
Filed Dec. 9, 1968, Ser. No. 782,362
Claims priority, application Canada, Dec. 26, 1967, 8,443
Int. Cl. D21f *1/40*
U.S. Cl. 162—301 **4 Claims**



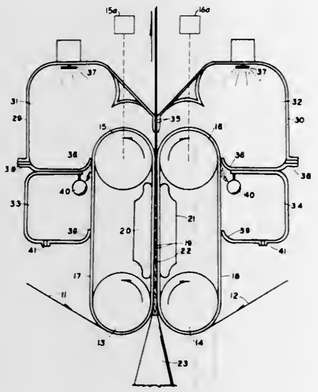
A twin-wire paper-web forming machine uses a headbox discharging stock between two forming wires, one of the wires being supported adjacent the headbox by a rider breast roll. The rider breast roll is in turn directly supported by a relatively stiff master roll, the breast roll having a diameter significantly less than the diameter of the master roll which result in the breast roll being flexible with respect to the master roll. The profile of the master roll is reflected in the surface of the breast roll thereby resulting in controlled deflection.

3,578,558
TWIN WIRE PAPER MAKING ASSEMBLY
Terence E. McCarrick and Olaf S. Antonsen, Watertown, N.Y., assignors to The Black Clawson Company, Hamilton, Ohio
Filed Feb. 19, 1968, Ser. No. 706,514
Int. Cl. D21f *1/00*
U.S. Cl. 162—303 **3 Claims**



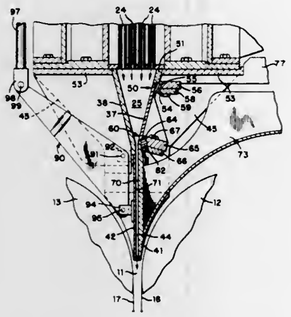
Apparatus for making paper in a twin wire paper making machine. A pair of endless forming webs looped around a pair of spaced parallel breast rolls forms a nip of predetermined width. Deflector assemblies in contact with the forming webs downstream of the breast rolls guide the webs into gradually converging relation. An adjustable regulator bar, positioned in contact with one of the webs between the breast rolls and deflector assemblies, forces the one web into predetermined relation with the other web, thus establishing a preset distance therebetween.

3,578,559
ENDLESS BELT WITH POCKETS FOR COLLECTING WATER DRAINED THROUGH A FOURDRINIER WIRE
Ralph A. Beck, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.
Filed Aug. 29, 1969, Ser. No. 854,180
Int. Cl. D21f *1/36*
U.S. Cl. 162—303 **6 Claims**



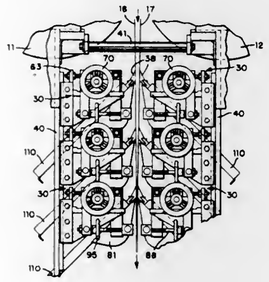
The surface of a paper forming wire opposite the papermaking stock carried thereby runs in contact with a portion of an endless moving drainage belt provided with enclosed pockets which have openings facing an adjacent wire to collect water drained from the stock through the adjacent wire and which are subsequently emptied by gravity along a portion of the belt path remote from the wire. Such apparatus is particularly suitable for use in twin wire vertical formation machines in which a separate drainage belt is provided in contact with each forming wire in close proximity to the headbox slice.

3,578,560
HEADBOX FOR TWIN WIRE PAPER MAKING APPARATUS
Willard C. Notbohm, Charles A. Lamb, and J. Leslie Hanson, Watertown, N.Y., assignors to The Black Clawson Company, Hamilton, Ohio
Filed Feb. 6, 1968, Ser. No. 703,299
Int. Cl. D21f *1/06*
U.S. Cl. 162—344 **11 Claims**



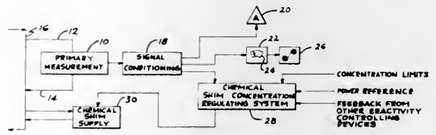
A headbox for use in a twin wire vertical paper making machine comprising a downwardly extending slice having elongated parallel side walls which form the stock into a high speed jet directed into the area between twin breast rolls. One of the lips of the slice is adjustable in such a manner that it always remains parallel to the opposite lip so that the thickness of the jet can be varied without the creation of turbulence or pressure variation within the jet as it is formed between the lips. In another embodiment, one slice lip is simultaneously adjusted with one breast roll to change the width of the forming zone and the slice at the same time.

3,578,561
PAPER FORMING APPARATUS
Terence E. McCarrick and Olaf S. Antonsen, Watertown, N.Y., assignors to The Black Clawson Company, Hamilton, Ohio
Filed Mar. 8, 1968, Ser. No. 711,583
Int. Cl. D21g *9/00*
U.S. Cl. 162—352 **11 Claims**



A machine for forming paper from stock between a pair of vertically traveling spaced forming wires which extend between upper breast rolls to lower couch rolls. The water is removed from the stock to a drainage system by deflectors mounted on opposite sides of the forming zone in contact with the wires which cause the wires to exert a squeezing action on the stock and which remove water from the rear side of the wires. The deflectors are individually adjustable so that the wire engaging surfaces move horizontally in a plane parallel to the wires without any vertical movement. Separate apparatus is also provided for adjusting the angular position of each wire engaging surface.

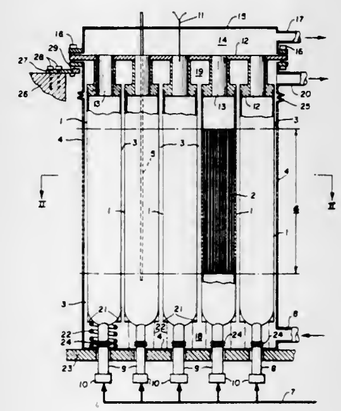
3,578,562
METHOD AND APPARATUS FOR CONTINUOUS MONITORING AND CONTROL OF NEUTRON ABSORPTION PROPERTIES OF CHEMICAL SHIM
Loering M. Johnson, Tariffville, and Arthur M. Yuile, Windsor, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.
Filed Oct. 23, 1968, Ser. No. 769,778
Int. Cl. G21c *17/00, 1/22;* **G01t** *3/00*
U.S. Cl. 176—22 **7 Claims**



An apparatus, and method of operation thereof, to continuously monitor and control the neutron absorption properties of chemical shim used in regulating reactivity of a pressurized water nuclear reactor. Coolant-moderator fluid, including the soluble neutron absorption property in the chemical shim, is continuously passed

through a chamber having plural neutron detectors surrounding a neutron source of known strength. Utilizing the neutron absorptiometry principle, a signal representative of the concentration of the absorption properties of the chemical shim in the coolant-moderator is derived. This signal is then applied through signal conditioning means to a readout and alarm device so that constant monitoring of the shim concentration absorption properties may be accomplished; additionally, the signal may be applied to maintain the concentration of neutron absorption properties of the chemical shim in the coolant-moderator at a desired level.

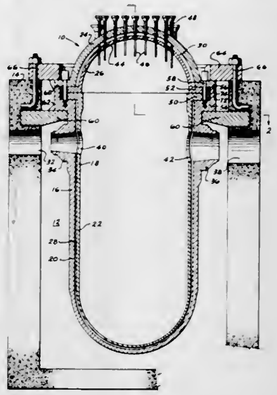
3,578,563
FLUID COOLANT APPARATUS FOR A NUCLEAR REACTOR
Charles Strohmeyer, Jr., Bern Township, Berks County, Pa., assignor to Electrodyne Research Corporation, Reading, Pa.
Continuation-in-part of application Ser. No. 653,475, July 14, 1967. This application Dec. 22, 1967, Ser. No. 693,004
Int. Cl. G21c *15/02*
U.S. Cl. 176—51 **6 Claims**



The invention provides an apparatus for cooling a nuclear reactor wherein there are two systems for flowing a coolant fluid, one system having multiple conduits in parallel relationship with and individually encompassing a portion of the longitudinally disposed nuclear fuel elements, the other system cooling the exterifor walls of the multiple conduits and wherein means are provided for controlling fluid flow selectively in each of the two systems.

3,578,564
DOUBLE CONTAINER REACTOR VESSEL
William D. Fletcher III, Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Oct. 31, 1968, Ser. No. 772,304
Int. Cl. G21c *13/02*
U.S. Cl. 176—87 **4 Claims**

Means for suspendedly mounting a double container reactor vessel within a vessel cavity formed in a foundation structure in a manner such that, in the event of failure of the outer vessel in any location, the inner vessel will remain secured to the foundation structure. The means comprises the provision of radial flanges on the shells and closure covers of the inner and outer container vessels arranged such that the inner vessel flanges are retained in sandwiched relation between the opposing faces of the outer vessel flanges. Annular shoulder means are provided on the foundation wall to vertically support the assembled vessel structure by engagement with the outer vessel shell flange. An annular lock ring releasably attached to the



foundation presents a bearing face adapted to engage the outer vessel closure cover flange to prevent upward movement of the retained flanges in the event of a reactor accident.

3,578,565
PROCESS FOR THE MANUFACTURE OF STEROIDS OF THE ANDROSTANE SERIES
Arno Johannes Schocher, Benken, Andor Furst, Basel, Hans Els, Binningen, and Elisabeth Becher and Gisela Gross, Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed Oct. 1, 1968, Ser. No. 766,021
Claims priority, application Switzerland, Oct. 5, 1967, 13,930/67
Int. Cl. C07c *167/18*
U.S. Cl. 195—51 **17 Claims**

Microbiological process for preparing 17-oxygenated androstanes by subjecting 20-oxygenated pregnanes to the action of a culture of the fungus *Gliocladium roseum*. The steroids prepared are known compounds which are pharmaceutically useful as androgenic agents and as intermediates which can be converted to known compounds which are progestational agents.

3,578,566
PROCESS OF TREATING OIL CONTAINING FERMENTATION DISCHARGES
Manfred Rudel, Markkleeberg, and Anton Gabert, Ulrich Behrens, and Dieter Pohland, Leipzig, Manfred Ringpfeil, Holzhausen, and Karl Sattler, Leipzig, Germany, assignors to Deutsche Akademie der Wissenschaften zu Berlin, Berlin-Aldershof, Germany
No Drawing. Filed Dec. 28, 1967, Ser. No. 694,120
Int. Cl. C12b *1/26*
U.S. Cl. 195—82 **12 Claims**

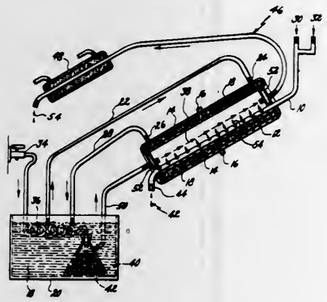
An oil containing fermentation discharge such as obtained in the aerobic fermentation of petroleum fractions and petroleum-like paraffinic products is subjected in the form of a dispersion of the oil and microorganisms in the nutrient medium to a gravitational field of a sufficient magnitude and for a time sufficient to effect a phase inversion, the fermentation medium and microorganisms in the inverted phase being dispersed in the oil so that the latter forms the external phase of the dispersion, and then effecting the separation of at least part of the oil from the microorganisms. Preferably the microorganism is yeast and the gravitational force is applied by means of a centrifugal field having an acceleration in excess of 10^3 *g*; *g* being the gravity acceleration.

3,578,567

PROCESS AND APPARATUS FOR THE CONTINUOUS FLOW, IN-LINE FRACTIONATION AND EXCHANGE OF VOLATILE SOLVENTS

Harry H. Malvin, Houston, Tex. (585 Carriage Way, Deerfield, Ill. 60015), and Marion J. Stansell, San Antonio, Tex. (8260–H Jamboree Circle, Colorado Springs, Colo. 80907)

Filed Oct. 31, 1968, Ser. No. 772,337
Int. Cl. B01d *3/34, 11/02*
U.S. Cl. 203—49 **9 Claims**



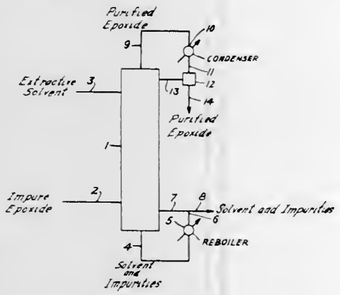
A method for separating the individual solvent components from a mixture of miscible solvents present together in a single solvent system. This method also provides for the continuous flow, in-line fractionation and exchange of miscible liquids of differing volatilization characteristics. A solvent mixture is introduced into a heated, inclined, perforated conduit. As the solvent mixture descends the heated conduit, a countercurrent stream of heated inert gas, saturated with vapors of the same solvent component to be retained in the conduit, is passed over the perforations. Preferential evaporation of the more volatile solvent components occurs, resulting in near complete removal of these components by the time the solvent mixture exits at the bottom of the conduit with the less volatile solvent component remaining within the conduit for subsequent collection.

3,578,568

PURIFICATION OF LOW MOLECULAR WEIGHT EPOXIDES BY EXTRACTIVE DISTILLATION WITH A GLYCOL OR GLYCOL ETHER

Thomas A. Washall, Wilmington, Del., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Nov. 29, 1968, Ser. No. 779,738
Int. Cl. B01d *3/34*
U.S. Cl. 203—64 **4 Claims**



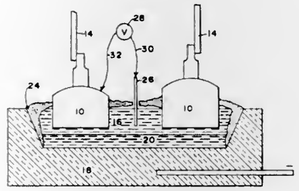
Method for the purification of C_3 to C_5 monoepoxides by extractive distillation with ethylene glycol, propylene glycol, ethylene glycol monomethyl ether or diethylene glycol monomethyl ether.

3,578,569

ANODE POLARIZATION DETECTOR

Robert A. Lewis, Los Altos, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Sept. 18, 1967, Ser. No. 668,360
Int. Cl. B01k *1/00;* **C22d** *3/12*
U.S. Cl. 204—1 **6 Claims**



This invention describes a method and a system for indicating the alumina requirements of the molten bath in an electrolytic cell for the production of aluminum so as to maintain stable operation. A reference electrode is inserted into the molten bath of the cell and an instrument for measuring potential is connected between the reference electrode and the operating anode system of the cell so as to measure the potential difference between the reference electrode and the operating system of the cell. Increasing potential difference indicates increasing polarization of the operating anode system and decreasing alumina content in the molten bath. Decreasing potential difference indicates decreasing polarization of the operating anode system and increasing alumina content of the bath. In accordance with the indication received, the alumina content in the bath is adjusted as needed to maintain stable operation of the electrolytic reduction cell.

3,578,570

ALUMINUM CAPACITOR FOIL

Gerald Harvey Kissin, Spokane, Wash., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

No Drawing. Filed Sept. 25, 1967, Ser. No. 670,402
Int. Cl. C23b *3/00*
U.S. Cl. 204—33 **2 Claims**

A capacitor foil alloy and a method for making capacitor foil by constituting an aluminum alloy of high purity aluminum containing from 0.02 to 0.1% magnesium, and less than 0.002% sodium, preferably preheating the alloy to a temperature above 950° F., rolling to a foil, electrolytically etching the foil and anodizing the etched foil.

3,578,571

METHOD OF ELECTRODEPOSITING A MAGNETIC ALLOY AND ELECTROLYTE THEREFOR

Paul E. McQuaid, Canoga Park, and Anthony J. Kolk, Jr., Palos Verdes Peninsula, Calif., assignors to General Precision Systems Inc.

Filed Sept. 9, 1968, Ser. No. 758,548
Int. Cl. C23b *5/32*
U.S. Cl. 204—43 **13 Claims**

Magnetically responsive coatings affording high coercivity properties and a very high squareness ratio are achieved by electrodeposition of Co, Ni and P from a bath in which the ratio of Co to Ni is approximately 1.5.

3,578,572

ELECTRODES FOR USE IN AQUEOUS ALKALI METAL CHLORIDE ELECTROLYTES

Denis Lee, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

No Drawing. Filed Oct. 21, 1968, Ser. No. 769,400
Claims priority, application Great Britain, Nov. 10, 1967, 51,219/67
Int. Cl. C01b *11/26;* **C23b** *5/24, 5/48*
U.S. Cl. 204—95 **9 Claims**

The invention relates to a platinum metal coated titanium electrode for use in electrolysis of brine. By electroplating the platinum group metal from an electrolyte containing a polybasic, hydroxy organic acid the resulting plated electrode is "activated."

3,578,573

PROCESS OF FINISHING PARTS OF ZIRCONIUM ALLOYS SUCH AS FOR USE WITH NUCLEAR REACTOR PLANTS

Friedrich Schweigert, Nuremberg, and Horst Bertholdt, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

No Drawing. Filed May 7, 1968, Ser. No. 727,365
Claims priority, application Germany, May 10, 1967, S 109,810
Int. Cl. C23b *3/06*
U.S. Cl. 204—140.5 **5 Claims**

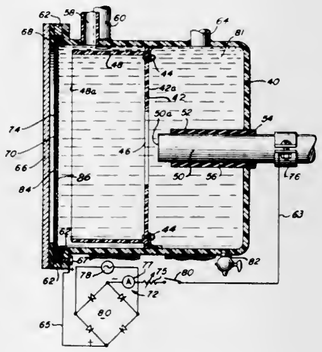
Finished parts of zirconium alloys, such as envelope tubes for nuclear fuel, are surface treated by electrolytic polishing. Preferably used is a polishing bath composed of acetic acid of about 99 to 100% concentration, perchloric acid of 40% concentration and hydrochloric acid of 37% concentration in a mixing ratio of about 300:1 to 10:10 to 40 parts.

3,578,574

ELECTROLYTIC MATERIAL REMOVAL PROCESS AND APPARATUS

Charles J. Trzyna, Long Grove, Ill., and Thaddeus S. Trzyna, Pasadena, Calif., assignors to Electronic Precision Industries Corporation, Inc.

Filed Oct. 18, 1965, Ser. No. 497,089
Int. Cl. B23p *1/00*
U.S. Cl. 204—143 **5 Claims**



A process for removing material from metal articles and for perforating metal articles using an electrolytical material removal technique.

3,578,575

PHOTONITROSATION OF NORMAL PARAFFINS

Orville W. Rigdon, Groves, and Robert S. Edwards and Edward H. Holst, Nederland, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Oct. 11, 1967, Ser. No. 674,612
Int. Cl. B01j *1/00;* **C07c** *131/00*
U.S. Cl. 204—162 **12 Claims**

A process for producing normal paraffin oximes and, in particular, normal paraffin oximes having from 10 to 13 carbon atoms wherein a C_{10} to C_{13} normal paraffin is photochemically reacted with a gaseous nitrosating agent, the nitrosating agent partial pressure being at least 125 mm. Hg and the photolytic reaction conducted under the influence of light excluding wave-lengths below 200 millimicrons. The process is admirably suited for the production of normal paraffin oximes from mixtures of C_{10} to C_{13} normal paraffins.

3,578,576

POLYPEPTIDE SYNTHESIS FROM AMMONIA AND METHANE USING HIGH ENERGY RADIATION

Robert M. Kliss, Marblehead, Mass., and Clifford N. Matthews and Robert E. Moser, St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Apr. 25, 1967, Ser. No. 641,723
Int. Cl. B01j *1/10*
U.S. Cl. 204—162 **7 Claims**

A process for synthesis of polypeptides by subjecting ammonia and methane to high energy radiation and then treating the resulting product with water.

3,578,577

SURFACER TREATING PROCESS FOR BLEMISHED ELECTROCOAT SUBSTRATES

Allan E. Gilchrist, Westlake, Ohio, assignor to SCM Corporation, Cleveland, Ohio

No Drawing. Filed Oct. 11, 1967, Ser. No. 674,639
Int. Cl. B01k *5/02;* **C23b** *13/00*
U.S. Cl. 204—181 **5 Claims**

This patent application sets forth a process for surface treating an electrode substrate used in electrocoating, specifically, one which has surface imperfections or blemishes, and a surfacer composition therefor. The surfacer composition is a curable mixture comprising binder resin and suffiicent electrically conductive filler mixed therewith for at most insignificantly changing, in cured thin final section on a blemished surface region of said substrate, the electrical resistance of said region relative to that of the untreated adjacent substrate to be coated. In accordance with the process surfacer composition is applied in thin layer to the blemished region of the substrate, cured (and when appropriate further and finally finished as by wet sanding), then the thus-treated substrate is electrocoated with paint.

3,578,578

MEASURING MEANS FOR MEASURING THE OXYGEN CONTENT IN LIQUID AND GASEOUS MEDIA

Otto Von Krusenstierna, Vasteras, Sweden, assignor to Allmänna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

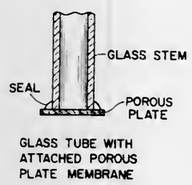
Filed Sept. 30, 1968, Ser. No. 763,760
Claims priority, application Sweden, Sept. 28, 1967, 13,306/67
Int. Cl. G01n *27/46*
U.S. Cl. 204—195 **10 Claims**

Measuring means for measuring the exygen content in a liquid or gaseous medium, comprising a solid oxygen

ion conducting electrolyte arranged in contact with a reference system having known oxygen potential and consisting of a metal and its oxide which is arranged in contact with a current collector. The current collector is

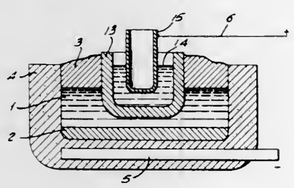
designed as a carrying element for the reference system and the electrolyte which are both arranged as layers on the current collector with the electrolyte outside the reference system.

3,578,579
ELECTROCHEMICAL APPARATUS
Normand C. Hebert and Martin E. Nordberg, Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Sept. 11, 1967, Ser. No. 666,843
Int. Cl. G01n *27/36*
U.S. Cl. 204—195 **8 Claims**



An electrochemical apparatus for determining the concentration of cations in solution and more particularly, an improved glass electrode for determining the activity of alkaline earth metal ions in an aqueous solution.

3,578,580
ELECTROLYTIC CELL APPARATUS
Wolfgang Schmidt-Hatting and Sebastian Huwyler, Sierre, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland
Filed Oct. 17, 1967, Ser. No. 675,881
Claims priority, application Switzerland, Apr. 28, 1967, 6,145/67
Int. Cl. C22d *1/02;* **B01k** *3/04*
U.S. Cl. 204—243 **8 Claims**



Apparatus for the electrolysis of molten oxides, especially of alumina, in which the anode is separated from the melt being electrolysed by a layer of oxygen-ion-conducting material, for example cerium oxide stabilised with calcium oxide or other oxides, which is resistant to the melt at the temperature of the electrolysis, and correlated inventions and discoveries appertaining thereto.

3,578,581
AROMATICS RECOVERY WITH CARBON MONOXIDE-CUPROUS FLUOROBORATE AND CARBON MONOXIDE-CUPROUS FLUOROPHOSPHATE COMPLEXES
George F. Davis, Creve Coeur, Herbert J. Gebhart, Jr., Ferguson, and Earle C. Makin, Jr., St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Feb. 12, 1969, Ser. No. 798,778
Int. Cl. B01d *17/00;* **C07c** *7/16*
U.S. Cl. 208—308 **10 Claims**

A process for the separation of aromatic hydrocarbons from admixture with aliphatic hydrocarbons or vinylaromatic hydrocarbons wherein separation is effected by selective complex formation with a complex comprising cuprous fluoroborate or cuprous fluorophosphate and carbon monoxide.

3,578,582
STARTUP PROCEDURE FOR CYCLIC REGENERATIVE PLATINUM-RHENIUM REFORMING PROCESS
Robert L. Jacobson, Pinole, Calif., assignor to Chevron Research Company, San Francisco, Calif.
No Drawing. Filed June 9, 1969, Ser. No. 831,773
Int. Cl. C10g *35/08*
U.S. Cl. 208—138 **9 Claims**

In a cyclic regenerative reforming process wherein a substantially sulfur-free naphtha fraction is contacted with a platinum group component-rhenium component catalyst at reforming conditions and in the presence of hydrogen to produce a high octane gasoline product, the process is started up by sulfiding the catalyst in situ with from 0.05 to 2 moles of sulfur per mole of the platinum group component and rhenium component, calculated as the metals.

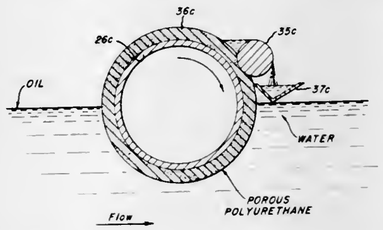
3,578,583
REFORMING PROCESS WITH PROMOTED LOW PLATINUM CONTENT CATALYST
Waldeen C. Buss, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.
No Drawing. Continuation-in-part of application Ser. No. 758,673, Sept. 10, 1968, which is a continuation-in-part of application Ser. No. 753,165, Aug. 16, 1968. This application Aug. 1, 1969, Ser. No. 846,971
Int. Cl. C10g *35/08;* **B01j** *11/12*
U.S. Cl. 208—138 **11 Claims**

Reforming a naphtha in the presence of hydrogen with a catalyst composition of a porous solid carrier and 0.01 to 0.3 weight percent platinum, 0.01 to 0.3 weight percent rhenium, and 0.001 to 0.1 weight percent iridium, and the novel supported platinum-rhenium-iridium catalyst.

3,578,584
HYDROCARBON CONVERSION PROCESS AND PLATINUM-GERMANIUM CATALYTIC COMPOSITE FOR USE THEREIN
John C. Hayes, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed May 28, 1969, Ser. No. 828,762
Int. Cl. B01j *11/08;* **C10g** *35/08*
U.S. Cl. 208—139 **20 Claims**

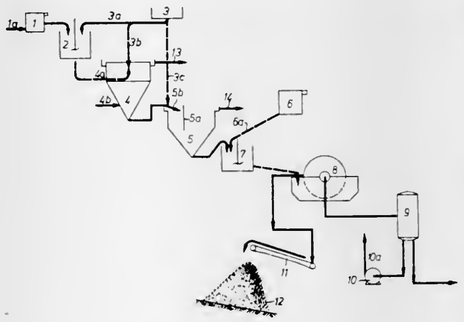
A catalytic composite, comprising a combination of a platinum group component, a germanium component, and a halogen component with a porous carrier material in amounts sufficient to result in the composite containing, on an elemental basis, about 0.01 to about 2.0 wt. percent of the platinum group metal, about 0.01 to about 5.0 wt. percent germanium, and about 0.5 to about 3.5 wt. percent halogen, is disclosed. Key feature of the subject composite is the use of the germanium component, which is prepared and maintained in an oxidation state above that of the elemental metal, to promote the platinum group component. The principal utility of the subject composite is in the conversion of hydrocarbons, particularly in the reforming of a gasoline fraction. A specific example of the catalyst disclosed is a combination of platinum, germanium oxide, and chloride with an alumina carrier material in amounts sufficient to result in the composite containing, on an elemental basis, about 0.05 to about 1.0 wt. percent platinum, about 0.05 to about 2.0 wt. percent germanium, and about 0.6 to about 1.2 wt. percent chlorine.

3,578,585
METHOD OF REMOVING FLOATING OIL FROM THE SURFACE OF A BODY OF WATER
Robert L. Yahnke, Munster, Ind., assignor to Standard Oil Company, Chicago, Ill.
Continuation of application Ser. No. 672,294, Oct. 2, 1967. This application Mar. 24, 1969, Ser. No. 809,524
Int. Cl. B01d *15/02, 33/02*
U.S. Cl. 210—30 **4 Claims**



A rotating cylinder covered with a layer of porous polyurethane absorbs oil flowing on a body of water, and a roller squeezes absorbed oil from the layer into a collecting trough.

3,578,586
TREATMENT OF SLURRIES
István Gál, János Hollo, Jenö Toth, and István Zagyvai, Budapest, Hungary, and Béla Galgoczi, deceased, late of Budapest, Hungary, by Katalin Galgaczi, trustee, Budapest, Hungary, assignors to Simonacco Limited, Cumberland, England
Continuation-in-part of application Ser. No. 624,331, Mar. 20, 1967. This application June 20, 1969, Ser. No. 835,315
Claims priority, application Hungary, Mar. 24, 1966, GA-803
Int. Cl. B01d *21/01*
U.S. Cl. 210—49 **7 Claims**



A method and equipment for treatment and dewatering of aqueous suspensions containing finely divided mineral solids having a particle size not greater than 30 microns wherein the aqueous suspensions is treated with a polyelectrolyte having a molecular weight of from 10,000 to 10,000,000 in at least two steps which comprises diluting the solids content of the suspension with water to a solids content to 2 to 5% by weight, treating the suspension under vigorous stirring with an aqueous solution of an amphoteric polyelectrolyte, conducting the treated suspension under continuous flow to a first settling zone and adding a further amount of polyelectrolyte for increasing the structural viscosity of the settled phase to an extent of at least 10,000 centipoises, separating water, then diminishing the structural viscosity of the settled phase to an extent of not more than 2000 centipoises, separating further water, conducting the settled phase while intermixing a further amount of polyelectrolyte to a second settling zone, and finally dewatering it.

3,578,587
COLOR REMOVAL PROCESS
Frank N. Kemmer, La Grange, Ill., assignor to Nalco Chemical Company, Chicago, Ill.
No Drawing. Filed Jan. 5, 1970, Ser. No. 815
Int. Cl. C02c *5/02*
U.S. Cl. 210—52 **4 Claims**

The amount of lime necessary to remove color from paper mill waste waters can be susbtantially reduced when the lime is used in combination with certain water-soluble anionic polymers.

3,578,588
POLYHYDROXYL COAGULANT COMPOUNDS
Andrew G. Tsuk, Laurel, Md., assignor to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed July 22, 1969, Ser. No. 843,814
Int. Cl. B01d *21/01*
U.S. Cl. 210—52 **12 Claims**

Compositions of polyhydroxyl compounds of the polygalactomannans such as guar gum or locust bean gum with borax are good flocculants for cellulosic substances. These compositions readily flocculate cellulose suspensions having a pH of 7 or more. The gums comprise cationically modified gums as well as the unmodified gums.

3,578,589
METHOD FOR TREATING COOLING WATER
Chih Ming Hwa, Arlington Heights, Ill., and Gary J. Antony, Burnsville, Minn., assignors to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed Mar. 17, 1969, Ser. No. 807,964
Int. Cl. C02b *5/06*
U.S. Cl. 210—58 **6 Claims**

Accumulated deposits of scale, and of mud, silt, sludge and other foulants, are removed from cooling water systems; and further deposition is inhibited; by incorporating into the water flowing through such systems a mixture of a nonionic surface active agent and from 0.01 to 10 parts by weight, per part by weight of the surface active agent, of an acrylic or methacrylic acid polymer or a water soluble salt of such polymer having a weight average molecular weight of from 400 to 95,000. The mixture is added to the cooling water system in amounts up to 500 parts per million.

3,578,590
FIRE-EXTINGUISHING COMPOSITION COMPRISING ETHOXYLATED ALKYLPHENOL AND ETHYLENE GLYCOL MONO LOWER ALKYL ETHER
Darle Lee Nieneker, Austin, and Leslie Preston Williams, Groves, Tex., assignors to Jefferson Chemical Company, Inc., Houston, Tex.
No Drawing. Filed Aug. 19, 1968, Ser. No. 753,714
Int. Cl. A62d *1/00;* **B01f** *17/42*
U.S. Cl. 252—8.05 **3 Claims**

An improved fire-fighting composition of an ethoxylated alkylphenol and an ethylene glycol mono lower alkyl

ether has been discovered. This improved fire-extinguishing composition is useful as a wetting agent, emulsifying agent, low-expansion or high-expansion foam and performs exceptionally well in the presence of both fresh and salt water.

3,578,591
FABRIC SOFTENER COMPOSITION
Christina Nicholson Lazaridis, Piscataway, and Harold Eugene Wixon, New Brunswick, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Filed Nov. 13, 1967, Ser. No. 682,592
Int. Cl. D06m *13/28, 13/40*
U.S. Cl. 252—8.7 **13 Claims**

A non-yellowing fabric-softening composition comprising a mixture of a sulfolene and an aliphatic alkanol which is designed for use in conjunction with anionic, cationic, and nonionic detergent compostions.

3,578,592
IMIDAZOLINE QUATERNARY SALTS AS SOIL RETARDANTS
Joseph John Pontelandolfo, Piscataway Township, Middlesex County, N.J., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Oct. 3, 1967, Ser. No. 672,461
Int. Cl. D06m *13/40, 13/46*
U.S. Cl. 252—8.8 **1 Claim**

The use of imidazolinium halides as soil retardants for non-cellulosic textile materials, the treated textile materials and a stabilized composition containing said halide and a formaldehyde-bisulfite addition product.

3,578,593
LIQUID ELECTROSTATIC DEVELOPING MEDIUM HAVING A MIXTURE OF NON-ESTERIFIED TRICYCLIC DITERPENE CARBOXYLIC ACID AND POLYHYDRIC ALCOHOL
Lauren L. Hulse, Lexington, Ky., assignor to Addressograph-Multigraph Corporation, Mount Prospect, Ill.
No Drawing. Filed Sept. 1, 1967, Ser. No. 664,957
Int. Cl. G03g *9/04*
U.S. Cl. 252—62.1 **12 Claims**

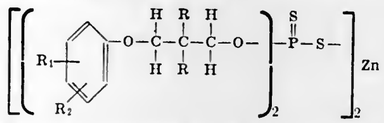
A liquid electrostatic developer having toner particles dispersed in an insulating, nonpolar organic liquid carrier is used for the development of zinc oxide coated copy sheets and the like. A tricyclic diterpene carboxylic acid or heat blended mixture of a tricyclic diterpene carboxylic acid and a polyhydric alcohol absorbed on the toner particles orients the polarity and controls the magnitude of the charge on the toner particles. Suitable acids are levopimaric acid, abietic acid, neoabietic acid, dehydroabietic acid, dihydroabietic acid, tetrahydroabietic acid, dextropimaric acid, and isodextropimaric acid. Suitable polyhydric alcohols are ethylene glycol, triethylene glycol, glycerol, and pentaerythritol.

3,578,594
FIBER TREATING COMPOSITIONS
Bernard A. Dombrow, Teaneck, N.J., assignor to Diamond Shamrock Corporation, Cleveland, Ohio
No Drawing. Filed Nov. 24, 1967, Ser. No. 685,335
Int. Cl. D06m *13/20, 13/18*
U.S. Cl. 252—8.9 **8 Claims**

Fiber treating compositions containing from about 10% by weight to about 75% by weight of an ester of an ethoxylated arylphenol and from about 90% by weight to about 25% by weight of an ester of an ethoxylated aliphatic alcohol have reduced high temperature volatilities and enhanced high temperature stability. A useful fiber treating composition contains 25% by weight of an ester of an ethoxylated benzylphenol and 75% by weight of an ester of an ethoxylated aliphatic alcohol having from about 11 to about 15 carbon atoms. Also, fibers can be treated with esters of linear secondary alcohols or esters of ethoxylated secondary linear alcohols having low pour points. A typical example is fiber treated with the ester of an ethoxylated secondary linear alcohol having from about 11 to about 15 carbon atoms.

3,578,595
ZINC DI-3-ALKYLPHENOXY-2,2-DIALKYLPROPYL DITHIOPHOSPHATE AND AUTOMATIC TRANSMISSION FLUID CONTAINING SAME
Raymond C. Schlicht and Arthur W. Godfrey, Fishkill, N.Y., assignors to Texaco Inc., New York, N.Y.
Filed July 28, 1969, Ser. No. 845,445
Int. Cl. C09k *3/00*
U.S. Cl. 252—75 **5 Claims**

Zinc di-3-alkylphenoxy - 2,2 - dialkylpropyl dithiophosphate represented by the formula:

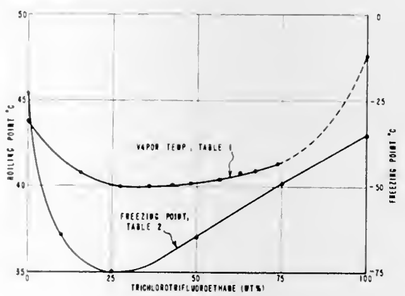


in which each R represents an alkyl radical having from 1 to 4 carbon atoms, R_1 is an alkyl radical having from 6 to 18 carbon atoms, R_2 is hydrogen or an alkyl radical having from 6 to 18 carbon atoms and the total number of carbon atoms in R_1 and R_2 is from 6 to 24 and a hydraulic fluid or automatic transmission fluid containing same.

3,578,596
PENETRATING OIL FORMULATION
David D. Conway, Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio
No Drawing. Filed June 25, 1968, Ser. No. 739,667
Int. Cl. C10m *1/50*
U.S. Cl. 252—49.6 **8 Claims**

Lubricating oil composition having penetrating, residual lubricating properties, and release characteristics is obtained by mixing 40–95% of hydrocarbon carrier (e.g mixture of naphtha and kerosene), 5–40% of an alkyl ester of a carboxylic acid containing about 8–24 carbon atoms, and about 0.1% of dialkyl polysiloxane.

3,578,597
MIXTURES OF PERFLUORODIMETHYLCYCLOBUTANE AND TRICHLOROTRIFLUOROETHANE
Bernhardt J. Eiseman, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Apr. 17, 1969, Ser. No. 816,995
Int. Cl. H01b *3/24;* **C09k** *3/06*
U.S. Cl. 252—66 **4 Claims**



A mixture of perfluorodimethylcyclobutane with 1,1,2-trichloro-1,2,2-trifluoroethane, said mixture containing about 26 to 42 weight percent 1,1,2-trichloro-1,2,2-trifluoroethane and having an essentially constant boiling point of about 40° C.

3,578,598
STABILIZATION OF N-CHLORO-IMIDES
Richard L. Burke, Madison, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Filed May 29, 1968, Ser. No. 732,844
Int. Cl. C11d *7/54*
U.S. Cl. 252—102 **12 Claims**

Cleansing compositions containing an N-chloro-imide and a stabilizing amount of a mercaptan compound of the following structural formula:

R—SH

wherein R is selected from the group consisting of alkyl containing from 4–12 carbon atoms, phenyl and benzyl.

3,578,599
STABILIZATION OF N-CHLORO-IMIDES
Richard L. Burke, Madison, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Filed May 29, 1968, Ser. No. 732,875
Int. Cl. C11d *7/54*
U.S. Cl. 252—102 **13 Claims**

Cleansing compositions containing an N-chloro-imide and a stabilizing amount of a dialkyl sulfoxide of the following structural formula:

wherein R and R_1 independently represent alkyl groups, the combined carbon content of such groups falling within the range of from 2 to 14.

3,578,600
STABILIZATION OF N-CHLORO-IMIDES
Richard L. Burke, Madison, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Filed May 29, 1968, Ser. No. 732,878
Int. Cl. C11d *7/54*
U.S. Cl. 252—102 **11 Claims**

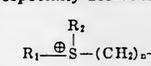
Cleansing compositions containing an N-chloro-imide and a stabilizing amount of a disulfide compound of the following structural formula:

R—S—S—R_1

wherein R and R_1 are independently selected from the group consisting of alkyl, aryl, aralkyl, and alkaryl the combined carbon content of such groups falling within the range of from 4–14.

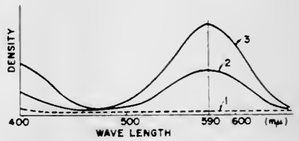
3,578,601
DETERGENT COMPOSITIONS CONTAINING SULFONIO CARBOXYLATES
Arnon O. Snoddy, Cincinnati, and Francis L. Diehl and Howard F. Drew, Wyoming, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Original application Aug. 23, 1966, Ser. No. 574,469. Divided and this application Nov. 12, 1968, Ser. No. 794,448
Int. Cl. C11d *3/04, 1/18*
U.S. Cl. 252—135 **8 Claims**

Detergent compositions containing sulfonio carboxylates, having the formula set forth below, and alkaline builder salts are especially useful in cool water detergency:

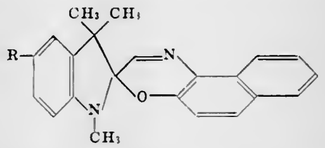


R_1 is C_{10}–C_{18} alkyl
R_2 is C_1–C_4 alkyl or hydroxyalkyl
n is 1–12.

3,578,602
PHOTOCHROMIC COMPOUND
Hisatake Ono, Tiaki Osada, and Kuniko Kosuge, Asakashi, Japan, assignors to Fuji Shashin Film Kabushiki Kaisha, Kanagawa, Japan
Filed Aug. 29, 1968, Ser. No. 756,180
Claims priority, application Japan, Aug. 30, 1967, 42/55,662
Int. Cl. G02b *5/24*
U.S. Cl. 252—300 **7 Claims**



A photochromic compound represented by the formula:



in which R can be hydrogen, a halogen, a cyan group, a nitro group, an alkyl group (1–8 carbons), an alkoxy group (1–8 carbons) or an alkoxy carbonyl group (1–8 carbons). Various resin and solvent systems which form photochromic compositions with the above compound are described in the specification. The compound or composition will vary from colorless (non-excited) to blue (under ultraviolet), and exhibits high reversibility.

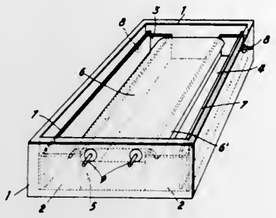
3,578,603
PROCESS FOR THE PREPARATION OF PHOSPHATE PHOSPHORS
Ernest A. Dale, Hamilton, Richard A. Fowler, Danvers, and Martha J. B. Thomas, Winchester, Mass., assignors to Sylvania Electric Products Inc.
No Drawing. Filed Mar. 20, 1969, Ser. No. 809,037
Int. Cl. C09k *1/36*
U.S. Cl. 252—301.4 **3 Claims**

A process of making calcium phosphate-type phosphors including the use of vaterite form of calcium carbonate as one of the starting materials.

3,578,604
PREPARATION OF MIXED GELS OF ACRYLAMIDE AND AGAROSE OR AGAR-AGAR
José Uriel, Paris, France, assignor to Etablissement Public: Centre National de la Recherche Scientifique, Paris, France
Filed Nov. 29, 1966, Ser. No. 597,713
Claims priority, application France, Nov. 30, 1965, 40,338; Oct. 3, 1966, 78,576, 78,578
Int. Cl. B01j *13/00*
U.S. Cl. 252—316 **8 Claims**

Mixed gels of acrylamide and a substance selected from the group consisting of agarose and agar-agar, which gels are especially suitable in the electrophoretic separation of natural products as molecular sieves and filters, are prepared by providing heated, buffered solutions of (1) melted agarose or agar-agar, and (2) acrylamide with N,N′-methylene-bisacrylamide, adding ammonium persulfate and N,N′,N′,-tetramethyl-ethylene diamine to solu-

tion (1), rapidly mixing so-treated solution (1) and solution (2), immediately casting the mixture in an oven at a



temperature above 50° C., and letting the acrylamide gel form and cool to room temperature.

3,578,605
PROCESS FOR MAKING DUAL WALLED MICROCAPSULES
George Baxter, Font Hill, Ontario, Canada, assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.
No Drawing. Filed Aug. 2, 1968, Ser. No. 749,600
Int. Cl. B01j *13/02;* **B44d** *1/16;* **A61k** *9/04*
U.S. Cl. 252—316 **10 Claims**

A method of forming dual walled microcapsules around core particles or nuclei of oily or solvent material in which the oily or solvent material containing a dibasic or long-chain organic acid chloride is dispersed in an aqueous solution of a hydrophilic colloidal protein and a second hydrophilic colloid which is adapted to undergo coacervation with the colloidal protein upon a reduction in the pH of the aqueous solution. The acid chloride reacts with the protein to form a thin film of insolubilized protein around the core particles or nuclei, releasing hydrochloric acid as a reaction by-product which lowers the pH of the aqueous solution to the point at which coacervation of the colloids takes place, depositing an outer shell of complex coacervate. The dual-walled capsules can be given a hardening treatment, using formaldehyde or the like. The resultant capsules retain even relatively volatile matter for long periods of time.

3,578,606
ALKYLLEAD ANTIKNOCK FLUIDS
Martin B. Smith and Norman G. Adams, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.
No Drawing. Filed May 27, 1968, Ser. No. 732,094
Int. Cl. C09k *3/00;* **C10l** *1/20*
U.S. Cl. 252—386 **14 Claims**

Incorporation of small amounts of methyl bromide or ethyl bromide, or both, into tetraethyllead-containing antiknock fluids having a scavenger combination of ethylene dibromide and ethylene dichloride wherein the latter scavenger predominates. The flash point by Tag closed cup (ASTM designation: D 56–64) is raised to above 100° F.

3,578,607
CORROSION INHIBITED PHOSPHORIC ACID COMPOSITION
Olen L. Riggs, Jr., and David W. Barnett, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.
No Drawing. Filed Feb. 9, 1968, Ser. No. 704,251
Int. Cl. C23f *11/00*
U.S. Cl. 252—389 **4 Claims**

A corrosion inhibited phophoric acid composition comprising a phosphoric acid solution having added thereto an effective amount of the reaction product of an acidic fluoride with an organic amine having a molecular weight between about 50 and about 500.

3,578,608
REGENERATING A PLATINUM OXIDE DEACTIVATED CATALYST RESULTING FROM USE IN ELIMINATING OXIDES OF NITROGEN FROM GASES
Kamran Aykan, Woodbury, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Sept. 24, 1968, Ser. No. 762,142
Int. Cl. B01j *11/18, 11/02*
U.S. Cl. 252—411 **6 Claims**

Regenerating a deactivated platinum catalyst by heating a platinum oxide deactivated catalyst on a carrier and passing gas inert in the system under conditions of regeneration over the deactivated catalyst for a time and at a temperature sufficient to cause dissociation of a platinum oxide and reform platinum in metallic form on the carrier.

3,578,609
ION EXCHANGE RESIN CONTAINING ZERO-VALENT METAL
Werner O. Haag, Trenton, and Darrell Duayne Whitehurst, Raritan, N.J., assignors to Mobil Oil Corporation
No Drawing. Filed Oct. 2, 1967, Ser. No. 672,007
Int. Cl. C07c *5/02*
U.S. Cl. 252—430 **4 Claims**

This specification discloses an ion exchange resin containing zero-valent metal. In the preparation thereof, an ion exchange resin is contacted with a reducing agent to fix the reducing agent in the resin. Thereafter, the resin is contacted with a soluble metal compound, the metal being from Groups VIII, I–B, II–B, III–B, IV–B, V–B, VI–B, and VII–B of the Periodic Table. The metal of the compound is thereby reduced to the zero-valent state in situ in the resin. The resulting product may be employed as a catalyst.

3,578,610
PROCESS FOR FABRICATION OF STOICHIOMETRIC URANIUM MONOCARBIDE
Bruce M. Johnson, Michael A. De Crescenti, and James G. Darrah, Wethersfield, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
No Drawing. Filed Nov. 30, 1960, Ser. No. 72,798
Int. Cl. G21c *21/02;* **C01g** *43/00*
U.S. Cl. 264—.5 **8 Claims**

1. In a process for fabrication of stoichiometric uranium monocarbide, the steps of cold-pressing UC in a die in a vacuum under pressures from 40 to 120 tons per square inch, said UC having a carbon content between 4.70% and 4.88% and having less than 0.2% oxygen, and sintering the cold-pressed UC in a vacuum at temperatures between 3500 and 3800° F. for two to four hours in a vacuum between 10^{-5} to 10^{-6} mm. of Hg.

3,578,611
AROMATIC POLYMERS AND METHOD
Norman Bilow, Los Angeles, and Leroy J. Miller, Canoga Park, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
No Drawing. Filed Sept. 5, 1967, Ser. No. 665,267
Int. Cl. C08g *33/00, 49/00*
U.S. Cl. 260—2 **8 Claims**

The method of providing commercially useful new aromatic polymer compositions from fused aromatic ring compounds as anthracene, naphthalene and phenanthrene, and mixtures thereof, including mixtures of same with monomers and/or polymers of biphenyl, terphenyls, quaterphenyls, and other aromatic monomers and phenylene oligomers and polyphenyls with not more than 5 aromatic rings, and the products thereof which are heat curable resins in combination with monofunctional and preferably polyfunctional curing agents which produce reactive electrophilic intermediates, including such products.

3,578,612
POLYURETHANE FOAMS BASED ON DIMER FATTY ACID POLYALKANOLAMIDES
Christian Burba, Lunen, Manfred Drawert, Werne, and Eugen Griebsch, Unna, Germany, assignors to Schering A.G., Berlin and Bergkamen, Germany
No Drawing. Continuation-in-part of applications Ser. No. 700,001, Jan. 24, 1968, and Ser. No. 743,958, July 11, 1968. This application July 24, 1969, Ser. No. 844,650
Claims priority, application Germany, Jan. 31, 1967, P 17 95 024.02
Int. Cl. C08g *22/08, 22/46, 51/72*
U.S. Cl. 260—2.5 **4 Claims**

Foams of a synthetic amide group-containing polyurethane resin formed by reacting and foaming a polymeric fatty acid alkanolamide, or an alkoxylated polymeric fatty acid alkanolamide, with a polyisocyanate. The polymeric fatty acid alkanolamide is made typically by condensing dimerized fatty acid with mono- or dialkanolamines. The foams have excellent resistance to hydrolysis.

3,578,613
ADHESIVE DIP COMPRISING A RUBBER LATEX AND TRIS(DIPHYDROXYBENZYL) PHENOL
Wun T. Tai, Monroeville, Pa., assignor to Koppers Company, Inc.
No Drawing. Filed Nov. 29, 1968, Ser. No. 780,278
Int. Cl. C08c *9/16;* **C08d** *9/10*
U.S. Cl. 260—3 **5 Claims**

Adhesive dips containing tris(dihydroxybenzyl)phenol are used to bond textile cords to rubber. The adhesive dips are useful for the bonding of nylon, rayon, and the especially difficult to bond polyester tire cords to rubber, giving excellent adhesive properties.

3,578,614
ALPHA-HYDROXY-CARBOXYLIC ACIDS AS CURING RATE ACCELERATORS FOR CURABLE POLYMER SYSTEMS
Walter R. Wszolek, Sykesville, Md., assignor to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed Oct. 21, 1968, Ser. No. 778,368
Int. Cl. C08d *9/02;* **C08f** *27/06;* **C08g** *22/00*
U.S. Cl. 260—13 **21 Claims**

This invention relates to accelerated curing of a liquid composition comprising a polyene containing at least two reactive unsaturated carbon to carbon bonds per molecule and a polythiol containing at least two thiol groups per molecule, the total combined functionality of (a) the reactive unsaturated carbon to carbon bonds per molecule in the polyene and (b) the thiol groups per molecule in the polythiol being greater than four, in the presence of a novel class of curing rate accelerators from the group consisting of oxalic acid and an α-hydroxy carboxylic acid of the formula

wherein R and R′ are independently selected from the group consisting of —CH_2COOH, —CHOHCOOH, hydrogen, aryl, alkyl containing 1–18 carbon atoms.

3,578,615
EPOXY RESIN COATINGS HAVING IMPROVED CATHODIC DISBONDING RESISTANCE
Robert J. Moore, Short Hills, and Roy A. Allen, Iselin, N.J., assignors to Shell Oil Company, New York, N.Y.
No Drawing. Filed Apr. 8, 1968, Ser. No. 719,719
Int. Cl. C08g *30/12*
U.S. Cl. 260—18 **10 Claims**

Epoxy resin powder coatings having improved cathodic disbonding resistance and which can be efficiently applied ly fluidized bed techniques comprise (1) a polyepoxide, (2) an epoxy curing agent, (3) a catalyst, and (4) a suitable bonding additive hereinafter more fully described (e.g., barium sulfate, strontium chromate, o-nitrophenol, phosphoric acid, and aminosilanes).

3,578,616
PROCESS FOR CURING POLYEPOXIDES AND RESULTING PRODUCT
Lawrence D. Harry, Midland, Mich., and George A. Sweeney, Erlenbach, Switzerland, assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Continuation-in-part of application Ser. No. 682,646, Nov. 13, 1968, which is a continuation-in-part of applications Ser. No. 480,128, Aug. 16, 1965, and Ser. No. 657,059, July 31, 1967. This application July 17, 1968, Ser. No. 745,364
Int. Cl. C08g *30/12*
U.S. Cl. 260—18 **9 Claims**

A process for curing a polyepoxide to obtain a clear colorless casting adaptible for optical applications comprising reacting:

(A) a mixture of (1) epoxy resin and (2) hexahydrophthalic anhydride and
(B) a curing catalyst composition comprising
  (1) an equal weight mixture of
    (a) a metal carboxylate e.g. Zn oleate, Zn or Sn–II 2-ethyl hexoate and Na salicylate
    (b) triphenyl phosphite
  (2) the product of reaction at 40 to 100° C. of H_3PO_4 with an aliphatic glycidyl ether in the presence of a solvent such as glycerine, polyethylene glycol or a glycerine initiated polypropylene glycol
  (3) an amount of hexahydrophthalic anhydride sufficient to bring the total in the system up to 40 to 100 parts by weight of polyepoxide.

3,578,617
COLD WATER-DISPERSIBLE EMULSIONS OF WATER REPELLENT COMPOSITIONS CONTAINING TRIAZINE-FORMALDEHYDE CONDENSATION PRODUCTS
Kwok Toy Louis, Wyckoff, Donald W. Wurmser, Jackson, and Herbert Zaritsky, Toms River, N.J., assignors to Ciba Corporation, Summit, N.J.
No Drawing. Filed Apr. 17, 1969, Ser. No. 817,180
Int. Cl. C08g *9/30*
U.S. Cl. 260—21 **9 Claims**

Cold water-dispersible aqueous emulsions of water repellent compositions containing triazine-formaldehyde condensation products are provided which are comprised of the water repellent composition, a higher molecular weight polyethyleneglycol-alkylphenyl ether, a solvent for the water repellent composition which is water-immiscible, and a second solvent which is miscible with the water-immiscible solvent and soluble in water. The emulsions of this invention are especially useful for imparting water repellence to textiles.

3,578,618
VINYL ACETATE-ETHYLENE COPOLYMER AQUEOUS PAINT COMPOSITIONS
Herbert P. Beardsley, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 664,285, Aug. 30, 1967. This application July 7, 1969, Ser. No. 839,710
Int. Cl. C08f *37/00*
U.S. Cl. 260—17 **1 Claim**

Aqueous paint compositions containing vinyl acetate-ethylene copolymers having 5–40 percent ethylene are disclosed. Also, there are disclosed paint compositions wherein the copolymers contain small quantities of carboxylic acids, such as acrylic and methacrylic, which have improved freeze-thaw stability.

3,578,619
PROCESS OF PREPARING METAL CHELATES OF β-KETOESTERS
James A. Reeder, Poland, Ohio, assignor to British Columbia Research Council
No Drawing. Filed Feb. 28, 1969, Ser. No. 803,471
Int. Cl. C07c *11/26;* **C07d** *107/00, 3/64*
U.S. Cl. 260—22 **23 Claims**

An improved process for preparing metal chelates of β-ketoesters derived from higher alcohols, glycols, polyols or polymers containing hydroxyl groups which comprises reacting a higher alcohol, glycol, polyol or polymer containing hydroxyl groups with a metal chelate of a β-ketoester derived from a volatile alcohol, so that a transesterification takes place with elimination of the volatile alcohol.

3,578,620
COLOR STABILIZED UNSATURATED INTERPOLYMERS
Paul J. Prucnal, Monroeville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
No Drawing. Filed Apr. 2, 1969, Ser. No. 812,888
Int. Cl. C08f *45/58*
U.S. Cl. 260—23.7 **15 Claims**

This invention relates to the stabilization and especially the color stabilization of certain unsaturated hydrocarbon polymers which are non-rubbery interpolymers of a cyclic polyene and at least one monoolefin, said interpolymer having an essentially saturated carbon chain containing a substantial proportion of the total carbon atoms in the polymer molecule and containing sufficient ethylenically unsaturated groups in the polymer molecule to permit substantial curing of films thereof by an oxidative mechanism, said interpolymers having an intrinsic viscosity of 0.6 or less. The stabilizers, which do not prevent oxidative cure, are a combination of epoxides such as epoxidized soybean oil or epoxidized higher fatty acid esters and tri-(alkylphenyl)phosphites.

3,578,621
DIESTERS EXHIBITING INTERNAL-EXTERNAL LUBRICATING PROPERTIES IN STRUCTURAL RESINS
Christian H. Stapfer, Newtown, Pa., assignor to Carlisle Chemical Works, Inc., Reading, Ohio
No Drawing. Filed Aug. 27, 1968, Ser. No. 755,736
Int. Cl. C08f *45/36;* **C08g** *51/36*
U.S. Cl. 260—31.6 **10 Claims**

Esters, which have a formula corresponding to

$$R-\overset{O}{\overset{\|}{C}}-O-R_1-O-\overset{O}{\overset{\|}{C}}-R \text{ and } R-O-\overset{O}{\overset{\|}{C}}-R_1-\overset{O}{\overset{\|}{C}}-O-R$$

wherein R is an alkyl radical having 15 to 30 straight chain carbon atoms and R_1 is an alkylene radical or alkenylene radical having 2 to 12 straight chain carbon atoms, have been found to unexpectedly act as combined internal and external lubricants for structural resins.

3,578,622
SPRAYABLE ADHESIVE
Francis W. Brown, West St. Paul, and Leon V. Kremer, Cottage Grove, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Continuation-in-part of application Ser. No. 702,807, Feb. 5, 1968. This application Sept. 12, 1969, Ser. No. 857,536
Int. Cl. C08f *45/30*
U.S. Cl. 260—33.8 **20 Claims**

A sprayable adhesive composition is provided which contains a higher concentration of acrylate polymer than was previously possible in sprayable formulations, the acrylate being an elastomeric, crosslinked polymer further characterized as having an organic solvent soluble portion and a predominating organic solvent insoluble portion.

3,578,623
COMPOSITIONS OF SATURATED POLYESTERS, INORGANIC SOLIDS, AND CYCLIC CARBONATES
Klaus Weissermel, Kelkheim, Taunus, and Rudolf Uebe, Eschborn, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Mar. 21, 1969, Ser. No. 809,432
Claims priority, application Germany, Apr. 6, 1968, P 17 69 119.9
Int. Cl. C08g *51/04*
U.S. Cl. 260—40 **15 Claims**

Thermoplastically processible moulding compositions of linear saturated polyesters of aromatic dicarboxylic acids, inert inorganic solid substances and cyclic carbonates that yield shaped articles free from flash.

3,578,624
CLAY FILLED, SULFUR-CURED ELASTOMERS COMPOUNDED WITH HYDROXYL-TERMINATED BUTADIENE POLYMERS
Edward Fuller Cluff, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Apr. 1, 1969, Ser. No. 812,289
Int. Cl. C08c *11/14;* **C08d** *13/26*
U.S. Cl. 260—41.5 **10 Claims**

An elastomeric composition comprising (a) a copolymer of at least one α-monoolefin, and at least one nonconjugated diene having at least one readily polymerizable double bond, (b) a hydroxyl-terminated liquid polymer containing at least 60% by weight of butadiene units, (c) a clay filler and (d) a sulfur curing system. The hydroxyl-terminated liquid polymer improves the physical properties of the vulcanizate produced therefrom.

3,578,625
STABILIZED COMPOSITION OF POLYPHENYLENE OXIDE
Seizo Nakashio, Nishinomiya-shi, and Isao Maruta, Ibaragi-shi, Japan, asssignors to Sumitomo Chemical Company, Ltd., Osaka, Japan
No Drawing. Filed Aug. 29, 1968, Ser. No. 756,317
Claims priority, application Japan, Sept. 2, 1967, 42/56,507
Int. Cl. C08g *51/62*
U.S. Cl. 260—45.75 **8 Claims**

The present composition of polyphenylene oxide has an improved stability against deterioration of quality and in discoloration, and comprises a polyphenylene oxide, 0.005 to 5% by weight of at least one kind of hindered phenol and 0.005 to 5% by weight of at least one member selected from the group consisting of trialkyl phosphites, triaryl phosphites, trialkyl thiophosphites, triaryl thiophosphites, thiophosphites, thioethers of carboxylic acid esters, thioethers, metal alkyldithiocarbamates and metal aryldithiocarbamates.

3,578,626
PROCESS FOR THE POLYMERIZATION OF ACETYLENE COMPOUNDS
Walter A. Kornicker, Brookline, Mass., assignor to Monsanto Company, St. Louis, Mo.
Original application July 30, 1965, Ser. No. 475,918. Divided and this application Feb. 24, 1969, Ser. No. 832,516
Int. Cl. C08f *9/00, 9/02*
U.S. Cl. 260—94.1 **1 Claim**

As a new composition of matter solid linear crystalline trans-polyacetylene having nickel therein. The product is produced by a process of polymerizing acetylene or acetylenic compounds by subjecting to electrolysis the complex compound of a nickel dihalide and an electron donor and acetylene or an acetylenic compound or mixtures thereof in the presence of an inert polar solvent.

3,578,627
PROCESS FOR TREATING HIGH VINYL LIQUID POLYBUTADIENE WITH SULFURIC ACID
Stephen Boutsicaris, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio
No Drawing. Filed June 16, 1969, Ser. No. 833,689
Int. Cl. C08d *5/02;* **C08f** *27/00*
U.S. Cl. 260—94.4 **12 Claims**

The process disclosed herein comprises the treatment of a high-vinyl liquid polybutadiene with concentrated sulfuric acid to convert the liquid polybutadiene to a tough thermoplastic elastomer. The liquid polybutadiene has at least 60% of the repeating units therein of the pendent vinyl type, and has an average molecular weight of 2,000–10,000. The polybutadiene is treated while in dilute solution in a hydrocarbon solvent which is inert to sulfuric acid, such as toluene, benzene, xylene, etc. The sulfuric acid is of at least 80% concentration, preferably at least 95%, and is used in a proportion of 5–15 parts by weight per 100 parts of polymer.

3,578,628
PROCESS FOR TREATING CELLULOSIC DIGESTING LIQUOR CONTAINING SOAP
Sun W. Chun, Pittsburgh, Pa., and William H. Friend, Edison, N.J., assignors to Union Camp Corporation, New York, N.Y.
No Drawing. Filed Apr. 21, 1969, Ser. No. 818,049
Int. Cl. C09f *1/00*
U.S. Cl. 260—97.7 **3 Claims**

Process for treating a cellulosic digesting liquor containing soap with a liquid hydrocarbon and alcohol to separate the soap from the liquor.

3,578,629
PROCESS FOR PREPARING REINFORCED POLYOLEFINS
Robert J. McManimie, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed May 21, 1968, Ser. No. 730,896
Int. Cl. C08f *45/04, 45/14*
U.S. Cl. 260—41 **19 Claims**

Process for preparing reinforced polyolefins by a Ziegler-type low pressure polymerization process comprising conducting the polymerization of a monomeric α-olefin in the presence of a filler which has been pretreated and prereacted with an organosilane of the formula

$$X_a-\overset{Y_b}{\overset{|}{Si}}-(R_n-Z)_c$$

where X is a hydrolyzable group capable of reacting with a hydroxyl group, Y is a monovalent hydrocarbon group, R is a divalent hydrocarbon group, Z is a group containing ethylenic unsaturation, *a* is an integer from 1 to 3, *b* is an integer from 0 to 2, and *c* is an integer from 1 to 3 provided that the sum of $a+b+c$ equals 4.

3,578,630
GLASS FILLED RANDOM COPOLYMERS OF AN OLEFIN AND AN UNSATURATED ACID
James K. Rieke and Frank H. Justin, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Continuation-in-part of application Ser. No. 531,381, Mar. 3, 1966. This application Feb. 14, 1969, Ser. No. 799,486
Int. Cl. C08f *45/10*
U.S. Cl. 260—41 **8 Claims**

Polymer compositions having improved tensile properties and improved impact resistance comprising a blend of between about 10 and about 40 weight percent glass fibers and between about 60 and about 90 weight percent of a random copolymer of an olefin such as ethylene and an ethylenically unsaturated carboxylic acid such as acrylic acid. The polymer compositions can be molded or extruded to produce useful articles of manufacture including gears, sprockets, washing machine agitators, gear housings, and the like.

3,578,631
METHOD OF PRODUCING MODIFIED POLYARYLATES
Vasily Vladimirovich Korshak, Ulitsa Gubkina 4, kv. 81; Svetlana Vasilievna Vinogradova, Jugo-Zapad kvartal 42–a, korpus 1, kv. 35; and Dzidra Rudolfovna Tur, Ulitsa Vavilova 30–a, kv. 120, all of Moscow, U.S.S.R.
No Drawing. Filed Mar. 1, 1967, Ser. No. 619,560
Claims priority, application U.S.S.R., Mar. 1, 1966, 1,058,760
Int. Cl. C08g *33/04*
U.S. Cl. 260—47 **1 Claim**

Modified polyarylates which are polyhydrazide-polyarylates are produced by condensing dicarboxylic acyl chlorides with bisphenols and hydrazine or dihydrazides of dicarboxylic acids. The modified polyarylates may be further converted to poly-1,3,4-oxadiazol polyarylates by heating in vacuum to 250–350° C.

3,578,632
CURING POLYEPOXIDES WITH MIXED CATALYSTS
Alfred Kuhlkamp, Hofheim, Taunus, and Edgar Fischer and Ernst Nolken, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Aug. 8, 1968, Ser. No. 751,031
Claims priority, application Germany, Aug. 23, 1967, F 53,308
Int. Cl. C08g *30/10*
U.S. Cl. 260—47 **8 Claims**

Liquid polyepoxides or solvent solutions of solid polyepoxides having 2 to 10 epoxy groups and preferably epoxide equivalents of 100 to 300 are cured without application of external heat by mixing them with a catalyst system consisting essentially of a mixture of a Lewis acid and a phosphorus compound of the formula

$$\text{(I) } R-\overset{O}{\overset{\|}{P}}-\underset{OH}{\underset{|}{OH}} \text{ or (II) } R'-O-\overset{O}{\overset{\|}{P}}-\underset{OH}{\underset{|}{OH}}$$

in which R and R′ represent alkyl, aryl, cycloalkyl, alkylaryl, aralkyl, alkoxyalkyl, alkoxyaryl, hydroxyalkyl, hydroxyaryl, hydroxyaralkyl or alkenyl. Epoxide resins are thus obtained by a room temperature cure which exhibit good resistance to alkalies. The products may be used for making glass fiber reinforced articles and for coating such materials as paper, metals, wood, textiles and plastics.

3,578,633
PROCESS FOR CURING POLYEPOXIDES WITH POLYCARBOXYLIC ACID ANHYDRIDES IN PRESENCE OF ALKALINE METAL SALTS OF CARBOXYLIC ACIDS
Gerd Rossa, Berkshire, England, assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed Dec. 11, 1968, Ser. No. 783,135
Claims priority, application Great Britain, Mar. 21, 1968, 13,718/68
Int. Cl. C08g *30/12*
U.S. Cl. 260—47 **17 Claims**

Polyepoxides may be cured to an insoluble, infusible product by reacting a polyepoxide containing more than one vicinal epoxy group per molecule with a polycarboxylic acid anhydride in the presence of an alkaline metal salt of a carboxylic acid.

3,578,634
THERMALLY STABLE COPOLYCARBONATE PHOSPHITE
Charles A. Bialous, Mount Vernon, and Donald B. G. Jaquiss, New Harmony, Ind., and John J. Keane, Pittsfield, Mass., assignors to General Electric Company
No Drawing. Filed Aug. 19, 1969, Ser. No. 851,454
Int. Cl. C08g *17/13*
U.S. Cl. 260—47 **8 Claims**

A thermally oxidatively stable copolycarbonate phosphite having an elemental phosphorus content of 0.0005 to about 1.0 weight percent based on the total weight of the polymer and to an improved process for preparing the polymer which consists of adding to the reaction of a dihydric phenol and a carbonate precursor a particular amount of a phosphorus trihalide such as phosphorus trichloride.

3,578,635
LACQUER COMPOSITIONS COMPRISING HALOGENATED CARBON BLACK
John F. Hardy, 1 Beach Circle, Andover, Mass. 01810; Donald Rivin, 4 Woodward Road, Framingham, Mass. 01701; and Jerome Aron, 61 Pinehurst Ave., Providence, R.I. 02908
No Drawing. Continuation-in-part of application Ser. No. 799,950, Feb. 17, 1969, which is a continuation-in-part of application Ser. No. 556,869, June 13, 1966. This application Aug. 12, 1969, Ser. No. 849,523
Int. Cl. C09d *3/64, 3/74*
U.S. Cl. 260—22 **7 Claims**

This disclosure relates to the use of certain halogenated carbon blacks as pigments in the preparation of paint and lacquer compositions which possess excellent non-flooding properties and excellent tinting properties.

3,578,636
METHOD FOR MANUFACTURING ALTERNATING COPOLYMERS OF CONJUGATED VINYL COMPOUNDS AND OLEFINIC UNSATURATED COMPOUNDS
Kohei Nakaguchi, Osaka, Shohachi Kawasumi, Niihama-shi, Masaaki Hirooka, Ibaraki-shi, Hiroshi Yabuuchi, Takatsuki-shi, and Hiroyoshi Takao, Ashiya-shi, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan
No Drawing. Continuation-in-part of application Ser. No. 537,705, Mar. 28, 1966. This application Nov. 18, 1969, Ser. No. 877,862
Claims priority, application Japan, Mar. 31, 1965, 40/18,822
Int. Cl. C08g *25/00*
U.S. Cl. 260—63 **10 Claims**

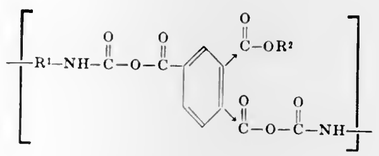
Vinyl compounds having a carbonyl or nitrile group at the conjugated position form a complex with an organoaluminum halide. When these components are subjected to reaction in the presence of a terminally unsaturated olefinic hydrocarbon and oxygen or an organic peroxide, an alternating copolymer of the conjugated vinyl compound and the olefinic monomer is obtained. The oxygen or organic peroxide promotes the desired copolymerization reaction of a mixture of these monomers to produce an alternating copolymer.

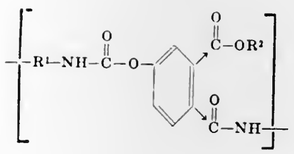
3,578,637
POLYMERS OF AROMATIC N-3-OXOHYDROCARBON-SUBSTITUTED ACRYLAMIDES
Lester E. Coleman, Cleveland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio
No Drawing. Original application Sept. 28, 1966, Ser. No. 582,501, now Patent No. 3,425,942, dated Feb. 4, 1969. Divided and this application July 19, 1968, Ser. No. 760,375
Int. Cl. C08f *3/40*
U.S. Cl. 260—63 **5 Claims**

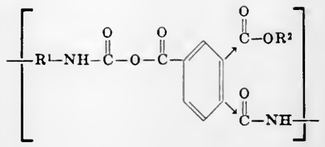
Novel N-3-oxohydrocarbon - substituted acrylamides containing an aromatic radical in either the 1 or 3 position on the oxohydrocarbon substituent are prepared by the reaction of acrylonitrile with an aromatic ketone having at least one alpha hydrogen atom, or with a mixture of such a ketone with an aromatic or aliphatic aldehyde or ketone having at least one alpha hydrogen atom, in the presence of sulfuric acid; or by the reaction of acrylonitrile with a β=hydroxy oxohydrocarbon or an α,β-unsaturated oxohydrocarbon derived from said aromatic ketone or mixture. Oil-soluble polymers formed by the polymerization of these acrylamides, and also by the polymerization of acrylamides containing at least two aromatic substituents, one in the 1 position and one in the 3 position of the nitrogen substituent, are useful as viscosity index improvers for lubricating oils.

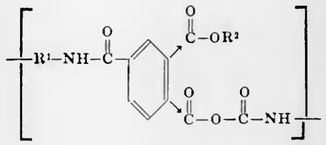
3,578,638
AROMATIC POLY(CARBAMIC-ANHYDRIDE-AMIDE-ESTER) AND A PROCESS FOR PREPARING THE SAME
James C. Fang, Media, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 650,196, June 30, 1967. This application Apr. 28, 1970, Ser. No. 32,743
Int. Cl. C08g *20/32*
U.S. Cl. 260—77.5 **11 Claims**

A poly(carbamic-anhydride-amide-ester) which is made by polymerizing the mono-ester of trimellitic anhydride and an organic diisocyanate is the subject of this invention. The polymer has the following recurring structural units









wherein the arrows denote isomerism; R^1 is a divalent organic radical having at least two carbon atoms; R^2 is selected from the group consisting of an alkyl radical having 1–8 carbon atoms, aryl radical, and a cycloaliphatic radical; and the polymer has an inherent viscosity at 25° C. of at least 0.15 measured at about 0.5% polymer solids in N-methyl pyrrolidone. The polymer can be converted into a polyamide-imide which is useful as durable coatings for metals and electrical conductors; also the polymer can be formed into films or fibers or can be converted into a foam structure.

3,578,639
POLYAMIDE-IMIDE-UREAS AND METHOD OF PREPARATION
Howard E. Sheffer, Burnt Hills, N.Y., assignor to Schenectady Chemicals, Inc., Schenectady, N.Y.
No Drawing. Filed Oct. 13, 1967, Ser. No. 675,020
Int. Cl. C08g *20/32*
U.S. Cl. 260—77.5 **8 Claims**

Polyamide-imides are prepared by reacting trimellitic anhydride with an aromatic diisocyanate. The product gives smoother films or copper wire than products prepared by reacting trimellitic anhydride mono acid chloride with an aromatic diamine and also does not have amic acid groups. A portion of the aromatic diisocyanate can be replaced by an aromatic diamine to form polymer groups. Cross-linking can be introduced by adding small amounts of isocyanates having at least three isocyanate groups.

3,578,640
METHOD FOR THE PRODUCTION OF THERMALLY STABLE POLYCAPROLACTAM
Ian C. Twilley, Petersburg, Va., Guido John Coli, Jr., Madison, N.J., and David W. H. Roth, Jr., Chester, Va., assignors to Allied Chemical Corporation, New York, N.Y.
Filed Mar. 7, 1968, Ser. No. 711,328
Int. Cl. C08g *20/14*
U.S. Cl. 260—78 **9 Claims**

Shaped articles such as filaments are produced from polycaproamide in a continuous process which comprises extruding a nascent molten polymer having less than about 12 meq./kg. of minor species of unreacted end groups and less than 2.5 percent by weight water extractables following polymerization. The molten polymer is kept substantially anhydrous and maintained under shear in a filled system until extruded to form a product. This process effectively inhibits the regeneration of monomer in the polymer and stabilizes the molecular weight thereof after polymerization thereby improving the quality of the products produced from the polymer melt prepared in accordance with the present invention.

3,578,641
RESINOUS ESTERS OF POLYMERIC N-HYDROXYIMIDES
John H. Johnson, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Apr. 1, 1968, Ser. No. 717,987
Int. Cl. C08g *20/38*
U.S. Cl. 260—78 **6 Claims**

Esters of N-hydroxy-substituted olefin-maleimide copolymers and N-blocked α-amino carboxylic acids or peptides; the method of producing said esters; and use of said esters in peptide synthesis which comprises condensing the ester with an α-amino carboxylic acid or a first peptide or an ester or amide of said acid or first peptide to obtain a second peptide and regenerated N-hydroxy-substituted olefin-maleimide copolymer. Also disclosed is the removal of the N-blocking from the peptide esters of said N-hydroxy-substituted copolymers and intramolecular cyclization of the unblocked ester to give cyclic peptides.

3,578,642
POLYMERIZATION OF ALKENE OXIDES WITH AN ORGANOALKALINE EARTH COMPLEX AND AN ORGANOALUMINUM CATALYST SYSTEM
Francis X. Mueller, Jr., Louisville, Ky., and James D. Brown, Bartlesville, Okla., assignors to Phillips Petroleum Company
No Drawing. Filed Dec. 18, 1968, Ser. No. 784,899
Int. Cl. C08g *17/02, 22/04, 23/00*
U.S. Cl. 260—78.3 **6 Claims**

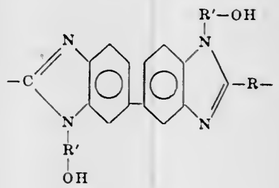
Alkene oxides are polymerized alone or copolymerized with acrylic acid esters, methacrylic acid esters, lactones, or other alkene oxides in the presence of an organoalkaline earth compound and an organoaluminum compound.

3,578,643
NEW POLYMERS FROM NITRILOTRIACETONITRILE AND IMINODIACETONITRILE
Louis L. Wood, Potomac, Md., and Richard A. Hamilton, Houston, Tex.; said Wood assignor to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed June 6, 1969, Ser. No. 831,232
Int. Cl. C08g *33/02*
U.S. Cl. 260—78.4 **15 Claims**

Polymers of nitrilotriacetonitrile and iminodiacetonitrile alone and in combination have been prepared. These polymers on pyrolysis yield electrically conducting materials having the same general shape as the starting prepyrolyzed material.

3,578,644
HYDROXYL MODIFIED POLYBENZIMIDAZOLES
Floyd D. Trischler, San Diego, Calif., assignor to Whittaker Corporation, Los Angeles, Calif.
No Drawing. Filed Feb. 23, 1968, Ser. No. 707,422
Int. Cl. C08g *33/02*
U.S. Cl. 260—78.4 **8 Claims**

This patent describes novel modified polybenzimidazoles having the following repeating unit



wherein R is a divalent aliphatic, cycloaliphatic or aromatic group; and R′ is divalent aliphatic. This patent further describes the procedures for the preparation of these novel polymers and uses of these polymers.

3,578,645

LACTONE POLYMERS AND PROCESS OF PREPARING

William Lee Hergenrother, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

No Drawing. Filed Sept. 25, 1969, Ser. No. 861,190
Int. Cl. C08f *15/28*
U.S. Cl. 260—78.5 **12 Claims**

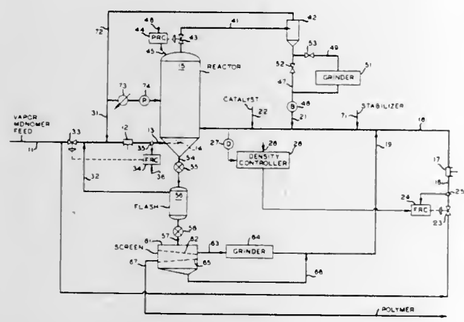
This invention relates to polymers produced from vinyl halide or vinylidene halide by reaction with a dialkyl maleate or fumarate, with pyrolysis of the polymer to form gamma lactone groups in the polymer chain. The invention includes the product and the process.

3,578,646

VINYL MONOMER POLYMERIZATION PROCESS

Charles W. Moberly and Gerald R. Kahle, Bartlesville, Okla., assignors to Phillips Petroleum Company

Continuation-in-part of application Ser. No. 778,709, Nov. 25, 1968. This application Oct. 29, 1969, Ser. No. 872,137
Int. Cl. C08f *1/04, 15/30, 45/00*
U.S. Cl. 260—85.7 **9 Claims**



Pourability of polymers of vinyl monomers is improved by catalytic vapor phase polymerization of vinyl monomers in the absence of substantial amounts of solvent or diluent and in the presence of certain pourability modifiers, which may also improve the color of the product polymer. The pourability of polymers formed by liquid phase bulk polymerization of vinyl monomers can be improved by these modifiers.

3,578,647

CHEMICAL CROSSLINKING SCORCH PREVENTING ADDITIVES AND PROCESS THEREFOR

Razmic S. Gregorian, Silver Spring, and Charles C. Kirk, Laurel, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed May 6, 1968, Ser. No. 727,008
Int. Cl. C08f *27/00*
U.S. Cl. 260—86.7 **4 Claims**

This invention relates to the prevention of scorch in a process for chemically crosslinking ethylene-containing homopolymers and copolymers by free radical generating crosslinking agents by the addition of chain transfer agents to the system.

3,578,648

PROCESS FOR THE PREPARATION OF VINYL CHLORIDE POLYMERS

Susumu Taima and Shigeo Nakada, Uozu-shi, Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

No Drawing. Filed Nov. 22, 1968, Ser. No. 778,299
Claims priority, application Japan, June 18, 1968, 43/41,661
Int. Cl. C08f *1/13, 3/30, 15/00*
U.S. Cl. 260—87.5 **8 Claims**

Emulsion type polymerization of vinyl chloride in an aqueous medium in the presence of a polymerization initiator is divided into two steps: the first step of polymerizing monomers to prepare polymers suitable as seeds and the second step of polymerizing fresh monomers using the above polymers as seeds to produce the final product polymers. And in each of the both steps respectively, is used a specified emulsifier system comprising (a) a higher fatty acid of carbon number of 10–18, (b) a high molecular surface active agent represented by the formula

$$HO(CH_2CH_2O)_m(CHCH_3CH_2O)_p(CH_2CH_2O)_nH$$

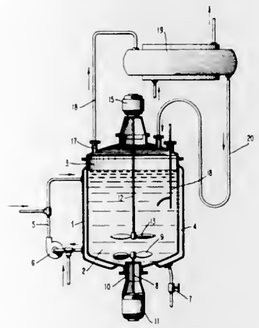
and (c) disodium phosphate or sodium bicarbonate. The final product polymers require no salting-out procedure and can be readily dehydrated. And the polymers can form a plastisol which shows a very low viscosity and is excellent in age stability, heat-stability and transparency. Thus the polymers are quite suitable for paste resins.

3,578,649

PREPARATION OF VINYL POLYMERS

Leon Badguerahanian, Montlignon, and Thomas Kemp, Bois-Colombes, France, assignors to Produits Chimiques Pechiney Saint-Gobain, Paris, France

Filed June 23, 1964, Ser. No. 377,230
Claims priority, application France, Mar. 10, 1964, 966,799
Int. Cl. C08f *1/11, 3/00, 3/30*
U.S. Cl. 260—92.8 **6 Claims**



Vinyl monomers, of which vinyl chloride is exemplary, are polymerized in suspension in aqueous medium and the conditions of polymerization produce superior products by withdrawing vaporized product, condensing it, and returning it to the suspension, producing, by aid of exterior heat exchange, equality of internal and external temperature. The product has notable superiority, especially in its acceptance of plasticizers and other modifiers.

3,578,650

METHOD FOR CARRYING OUT REACTIONS OF UNSATURATED HYDROCARBONS AT LOW TEMPERATURES

Maurice M. Mitchell, Jr., Wallingford, Pa., Harold M. Fisher, Redstone Arsenal, Ala., and Edward S. J. Tomezsko, Media, Pa., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Filed Feb. 20, 1969, Ser. No. 801,205
Int. Cl. C07c *5/10, 15/00;* **C08f** *29/00*
U.S. Cl. 260—93.7 **3 Claims**

Method for carrying out alkylation, polymerization or hydrogenation reactions of unsaturated hydrocarbons by contacting the unsaturated hydrocarbon such as an olefin or aromatic or combination thereof with tungsten hexafluoride at temperatures between 0° C. and 50° C.

3,578,651

ACYLATED LIGNOSULFONATES

Charles H. Ludwig, Bellingham, Wash., assignor to Georgia-Pacific Corporation, Portland, Oreg.

No Drawing. Filed May 6, 1968, Ser. No. 727,053
Int. Cl. C07g *1/00*
U.S. Cl. 260—124 **15 Claims**

A process for the acylation of lignosulfonate by the reaction, in an organic solvent, of a trialkylammonium lignosulfonate salt with a halide of carboxylic or sulfonic acid and products thereof.

3,578,652

RED PHENYLAZO NAPHTHOL DYESTUFF

Gustav E. Rast, Hamburg, and Russell I. Steiner, Williamsville, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Oct. 20, 1967, Ser. No. 676,741
Int. Cl. C09d *45/00, 29/16*
U.S. Cl. 260—151 **10 Claims**

Monoazo dyestuffs are prepared by coupling a 3-diazo-6-alkoxybenzene sulfonic acid and an α-naphthol disulfonic acid and precipitating the dye, either as the free acid or as an ammonium or metal salt. The trisodium salts are preferred because of their low toxicity to warm-blooded animals. The dyestuffs are useful as colorants for foods, pharmaceuticals, cosmetics, and the like, and form aluminum lakes useful as pigments for plastics.

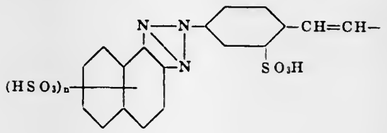
3,578,653

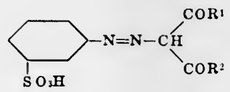
MONOAZONAPHTHOTRIAZOSTILBENE DYESTUFFS

William E. Wallace, R.D. 1, Box 190A, Rensselaer, N.Y. 12144

No Drawing. Filed Dec. 18, 1967, Ser. No. 691,141
Int. Cl. C07c *7/06;* **C09b** *43/00;* **D21h** *1/46*
U.S. Cl. 260—157 **5 Claims**

A monoazonaphthotriazolostilbene dyestuff, especially useful for dyeing paper, having in free acid form the formula





where n has a value of 1 or 2, R^1 is alkyl or phenyl, R^2 is R^1, alkoxy or phenoxy, or R^1 and R^2 jointly represent —NHCONH—. Use of these dyes results in dyeings having bright, pure and strong reddish to greenish-yellow shades with good fastness properties.

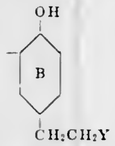
3,578,654

MONOAZO AND DISAZO DISPERSION DYESTUFFS CONTAINING A 2-HYDROXY - 5-β-CYANO-, β-LOWER ALKOXYCARBONYL- OR β-CARBOXAMIDOETHYL BENZENE GROUP

François Favre, Basel, Switzerland, assignor to J. R. Geigy A.G., Basel, Switzerland

No Drawing. Filed Nov. 6, 1967, Ser. No. 680,992
Claims priority, application Switzerland, Nov. 10, 1966, 16,196/66
Int. Cl. C09b *29/00, 29/12, 31/06*
U.S. Cl. 260—186 **8 Claims**

Monoazo and disazo dyestuffs are described which are characterized by a novel coupling component of the formula



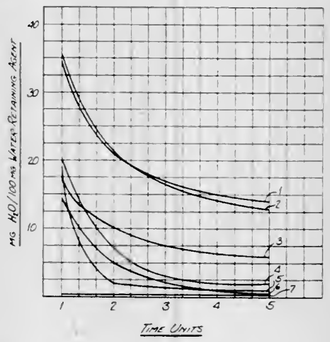
wherein Y represents the cyano group or a functional derivative of the carboxyl group, which does not dissociate acid in water and the benzene ring may contain further substituents; these novel dyestuffs must be free from water-solubilizing groups that dissociate acid in water, and are useful as dispersion dyestuffs for the dyeing of hydrophobic and particularly of polyglycol terephthalate and cellulose ester fibres. Their affinity for polyester fibers, particularly polyglycol terephthalate, is strong and the dyed fibers have good fastness to light and sublimation, their coloration being generally yellow, greenish yellow, orange or yellow-brown.

3,578,655

CARBOHYDRATE AGENT OF HIGH WATER RETENTION POWER, PROCESS OF MAKING SAME, AND COMPOSITION CONTAINING SAME

Joachim König and Günter Padberg, Hamburg-Rahlstadt, Germany, assignors to Chemische Fabrik Promonta GmbH, Hamburg, Germany

Filed Aug. 16, 1967, Ser. No. 661,110
Claims priority, application Germany, Aug. 19, 1966, C 39,914
Int. Cl. C07c *47/18*
U.S. Cl. 260—209 **11 Claims**



The reaction product of a carbohydrate such as a sugar, with an alkaline agent such as an alkali metal hydroxide solution has a high water retention power which is about as high as that of the neutral skin sugar fraction obtained by extraction of the stratum corneum and far superior to that of hygroscopic compounds such as glycerol, glycols, the water-soluble amino acid fraction of the skin and others which, although they attract water, permit rapid evaporation thereof.

3,578,656
METHOD OF MAKING ALLANTOIN POLYGALACTURONIC ACID COMPOUNDS
Sebastian B. Mecca, Abington, Pa., assignor to Schuylkill Chemical Company, Philadelphia, Pa.
No Drawing. Filed Feb. 24, 1969, Ser. No. 801,763
Int. Cl. C07c *95/04*
U.S. Cl. 260—209 **8 Claims**

Allantoin polygalacturonic acid compounds are prepared by dissolving a salt of allantoin and a salt of polygalacturonic acid in water containing a base, lowering the pH of the resulting solution with an acid or an aluminum salt to precipitate allantoin polygalacturonic acid when an acid is used or aluminum allantoin polygalacturonate when an aluminum salt is used, and recovering the precipitate.

3,578,657
ANTILIPAEMIC SULPHATED POLYSACCHARIDE
René Ricard, Jesus y Maria 27, and Miguel Margarit Tayá, Manuel Girona 56, both of Barcelona, Spain
No Drawing. Filed July 29, 1968, Ser. No. 748,204
Claims priority, application Spain, Aug. 9, 1967, 343,957
Int. Cl. C07c *69/32*
U.S. Cl. 260—234 **4 Claims**

An antilipaemic sulphated polysaccharide active under oral administration, which consists of a salt, preferably an alkaline salt, of a sulphated hydrodextran, with an average content of from 1 to 3 —SO_3— groups per monosaccharide groups and being essentially non-reducing as determined by the Somogyi method, having preferably an intrinsic viscosity of between 0.02 and 0.07 at 25° C. and containing a proportion of sulphur of from 10 to 20% by weight.

3,578,658
N'-SUBSTITUTED N-ARYLSULFONYL UREAS
Henri Dietrich, Arlesheim, Basel-Land, Switzerland, assignor to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Filed Aug. 21, 1967, Ser. No. 661,823
Claims priority, application Switzerland, Aug. 25, 1966, 12,360/66
Int. Cl. C07d *41/04*
U.S. Cl. 260—239 **16 Claims**

N - arylsulfonyl - decahydro - 1H - 3 - benzazepine - 3-carboxamides and pharmaceutically acceptable salts thereof with bases, which compounds have useful hypoglycaemic action, as well as starting materials for their production; therapeutic compositions containing these carboxamides or their pharmaceutically acceptable salts and processes of producing hypoglycaemic effects in mammals. As illustrative embodiment is N-(p-tolylsulfonyl)-decahydro-1H-3-benzazepine-3-carboxamide.

3,578,659
18-NOR-14β-PREGNANO-[13,14-f]-HEXAHYDRO-1,4-OXAZEPINES
Hans-Detlef Berndt, Berlin, Germany; Paul Buchschacher, Arlesheim, Switzerland, Ulrich Eder, Berlin, Germany, Andre Furlenmeier and Andor Furst, Basel, Switzerland, Ulrich Kerb, Berlin, Germany, Marcel Muller, Frenkendorf, Switzerland, and Rudolf Wiechert, Berlin, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed Mar. 28, 1969, Ser. No. 811,626
Claims priority, application Germany, Apr. 6, 1968, P 17 68 162.8
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 **28 Claims**

18 - nor - 14β - pregnano-[13,14-f] - hexahydro - 1,4-oxazepines and methods for their preparation are described. These compounds are valuable pharmaceuticals in that they exhibit blood pressure reducing and diuretic effects. They also possess a positive inotrope and myotrope activity, promote the blood flow to blood vessels surrounding the heart and also the stroke minute volume of the heart.

3,578,660
2-ACYLOXYCEPHALOSPORIN COMPOUNDS
Robin D. G. Cooper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
No Drawing. Filed Oct. 7, 1968, Ser. No. 765,686
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 **19 Claims**

Reaction of a 7-(protected amino)cephalosporin ester with a lead tetraacylate compound, followed by deesterification, to yield the corresponding 2-acyloxy-7-(protected amino)cephalosporin compound which is useful as an antibiotic.

3,578,661
PROCESS FOR THE PREPARATION OF 7-[α-(4 - PYRIDYLTHIO)ACETAMIDO]CEPHALOSPORANIC ACIDS
Robert Edward Havranek, Liverpool, and Leonard Bruce Crast, Jr., Clay, N.Y., assignors to Bristol-Myers Company, New York, N.Y.
No Drawing. Filed June 2, 1969, Ser. No. 829,707
Int. Cl. C07d *99/24*
U.S. Cl. 260—243 **6 Claims**

7-[α-(4 - pyridylthio)acetamido]cephalosporanic acid and related compounds having the same side chain and the pharmaceutically acceptable salts thereof are valuable antibacterial agents for use in mammals, including man. This disclosure relates to a new process for the preparation of such compounds, an example of which comprises reacting 7-aminocephalosporanic acid with 1-oxo-4-pyridylmercaptoacetyl chloride followed by mild reduction to produce 7 - [α-(4-pyridylthio)acetamido] cephalosporanic acid.

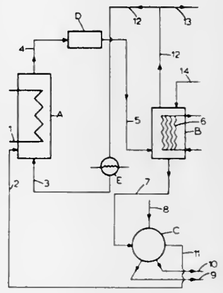
3,578,662
ISOCYANURATE MANUFACTURE
John H. Cornell, Jr., Arlington, Mass., assignor to Monsanto Research Corporation, St. Louis, Mo.
No Drawing. Continuation-in-part of application Ser. No. 165,249, Jan. 9, 1962. This application Oct. 10, 1967, Ser. No. 675,011
Int. Cl. C07d *55/38*
U.S. Cl. 260—248 **9 Claims**

A process for producing trimers of isocyanates which involves contacting a monoisocyanate mixture thereof with a catalyst system comprising a basic compound and a hydrocarbon carbonylic compound of from 1–12 carbon atoms. These trimers are useful for the manufacture of resins, adhesives, impregnants, and cast or molded materials.

3,578,663
PREPARATION OF CYANURIC CHLORIDE
Wilhelm Gruber and Wolfgang Kleine-Doepke, Darmstadt, Germany, assignors to Rohm & Haas G.m.b.H., Darmstadt, Germany
No Drawing. Filed Dec. 3, 1968, Ser. No. 780,911
Claims priority. application Germany, Dec. 15, 1967, P 16 95 658.4
Int. Cl. C07d *55/42*
U.S. Cl. 260—248 **3 Claims**

The yield of cyanuric chloride is increased and the life of an activated charcoal catalyst used in preparing cyanuric chloride by contact of cyanogen and chlorine in the gas phase at a temperature of from about 350° C. to about 750° C. is considerably lengthened by pretreatment of the activated charcoal catalyst for removal therefrom of metal compounds, preferably with a metal-solubilizing acid such as aqueous hydrochloric acid, formic acid, acetic acid or dilute nitric acid.

3,578,664
PROCESS FOR THE RECOVERY OF MELAMINE FROM A SYNTHESIS GAS MIXTURE CONTAINING HOT MELAMINE VAPOUR
Petrus J. C. Kaasenbrood, Sittard, Netherlands, assignor to Stamicarbon N.V., Heerlen, Netherlands
Filed June 30, 1969, Ser. No. 837,479
Claims priority, application Netherlands, June 29, 1968, 6809253
Int. Cl. C07d *55/24*
U.S. Cl. 260—249.7 **4 Claims**



A process for the recovery of melamine from a synthesis gas mixture containing hot melamine vapor, in which process the still hot gas mixture obtained from the melamine synthesis is cooled by contacting it with a liquid coolant, which is a urea melt, thereby yielding a suspension of melamine in the liquid coolant from which the melamine is subsequently separated.

3,578,665
3-HYDRAZINO-1,2,8,9-TETRAAZAPHENALENES
Karl J. Doebel, Ossining, and John E. Francis, Pleasantville, N.Y., assignors to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Continuation-in-part of applications Ser. No. 445,762, Apr. 5, 1965, Ser. No. 539,303, Apr. 1, 1966, and Ser. No. 583,980, Oct. 3, 1966, application Ser. No. 539,303 being a continuation-in-part of said application Ser. No. 445,762, and said application Ser. No. 583,980 being a continuation-in-part of said applications Ser. No. 539,303 and Ser. No. 445,767. This application Mar. 25, 1968, Ser. No. 715,555
Int. Cl. C07d *51/02*
U.S. Cl. 261—250 **11 Claims**

3-hydrazino-1,2,8,9-tetraazaphenalenes optionally substituted in the 4, 5, 6, 7 and/or 9 positions and their salts are cardiovascular agents and are prepared from 3-thiono-2,3-dihydro - 1,2,8,9 - tetraazaphenalenes. Representative embodiments are 3-hydrazino-1,2,8,9-tetraazaphenalene and 3-hydrazino-9-phenyl-1,2,8,9-tetraazaphenalene.

3,578,666
SUBSTITUTED IMIDAZOLINES, PYRIMIDINES AND DIAZEPINES
Robert E. Manning, Mountain Lakes, N.J., assignor to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Filed Aug. 26, 1968, Ser. No. 755,400
Int. Cl. C07d *19/06*
U.S. Cl. 260—256.5 **8 Claims**

Substituted imidazolines (e.g., 2 - (2 - imidazolinylmethylthio) - 3,4,5,6 - tetrahydro-pyrimidine dihydrochloride) and substituted pyrimidines (e.g., 6 - (2 - aminoethylimino) - 2,3,4,8 - tetrahydro - 6H - thiazolo[3,4-a] pyrimidine dihydrochloride). The compounds are useful as hypotensives.

3,578,667
QUATERNARY AMMONIUM ALICYCLIC CARBOXYLATES
Reginald L. Wakeman, Philadelphia, Pa., and Joseph F. Coates, Washington, D.C., assignors to Millmaster Onyx Corporation, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 563,388, July 7, 1966. This application Mar. 26, 1968, Ser. No. 715,963
The portion of the term of the patent subsequent to July 19, 1983, has been disclaimed
Int. Cl. C07d *35/24*
U.S. Cl. 260—286 **10 Claims**

A quaternary ammonium alicyclic dicarboxylate wherein the quaternary ammonium cation is the cationic residue of a quaternary ammonium compound having one alkyl group of 8 to 22 carbon atoms attached to the quaternary nitrogen and having a phenol coefficient of at least 100 with respect to *Staphylococcus aureus* and *Salmonella typhosa* at 20° C., and wherein the anion is the anionic residue of an alicyclic dicarboxylic acid containing at least one ring of five or six carbon atoms, or the chlorine substitution product thereof.

3,578,668
1-AMINOALKYLAMINO-BENZO[b] QUINOLIZINES
Richard A. Schnettler, Milwaukee, and John T. Suh, Mequon, Wis., assignors to Colgate-Palmolive Company, New York, N.Y.
No Drawing. Filed Aug. 26, 1968, Ser. No. 755,427
Int. Cl. C07d *39/12*
U.S. Cl. 260—288 **5 Claims**

The compounds are 1-alkylamino-benzo[b]quinolizines which are useful as antihypertensive agents and central nervous system stimulants and as intermediates in the preparation of pickling agents, wood preservatives and mothproofing agents. Representative of the compounds disclosed are 1-(N-cyclohexylaminoethyl)-1,3,4,6,11,11a-hexahydro-2H-benzo[b]quinolizine and 1-(dimethylaminoethyl)-1,3,4,6,11,11a - hexahydro-2H-benzo[b]quinolizine.

3,578,669
1-[(2 - SUBSTITUTED - 3 - INDOLYL) - LOWER-ALKANOYL] - CYCLOALKYL - LOWER-ALKYLPIPERIDINES AND 1 - [(2 - HYDROXYMETHYL-3 - INDOLYL)-LOWER-ALKYL]-CYCLOALKYL-LOWER-ALKYLPIPERIDINES
Bernard L. Zenitz, Colonie, N.Y., assignor to Sterling Drug Inc., New York, N.Y.
No Drawing. Filed Sept. 16, 1969, Ser. No. 858,507
Int. Cl. C07d *29/30*
U.S. Cl. 260—294 **17 Claims**

Novel 1 - [(2 - substituted-3-indolyl)-lower-alkanoyl]-cycloalkyl - lower - alkylpiperidines and 1 - [(2-hydroxymethyl - 3 - indolyl) - lower - alkyl]-cycloalkyl-lower-alkylpiperidines having useful psychomotor depressant activity.

3,578,670
NICOTINAMIDE INTERMEDIATES AND PROCESS FOR PREPARING SAME
Norman L. Wendler, Summit, David Taub, Metuchen, and Chan Hwa Kuo, South Plainfield, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Original application June 3, 1966, Ser. No. 554,963, now Patent No. 3,450,706. Divided and this application Dec. 24, 1968, Ser. No. 800,025
Int. Cl. C07d *29/30*
U.S. Cl. 260—294 **5 Claims**

Nicotinamide is prepared from 1 - acyl - 3 - cyano - 4 - amino - 1,2,5,6 - tetrahydropyridine or 1 - acyl - 3 - cyano - 4 - ketohexahydropyridine by reaction with an acid and tertiary butyl ions to form N - t - butyl - 1 - acyl-4-ketohexahydronicotinamide which is subsequently reduced and then acylated to effect reduction of the keto

group at the 4 position to a hydroxy substituent and then to an acyloxy group. The thus formed N - t - butyl-1 - acyl - 4 - acyloxyhexahydronicotinamide is then treated with a noble metal to effect the simultaneous removal of the substituents in the 1,4 position and aromatization of the ring to form N - t - butylnicotinamide, the latter which upon hydrolysis yields nicotinamide.

3,578,671

OXAZOLES

Kevan Brown, Woodley, England, assignor to John Wyeth & Brothers Limited, Taplow, Maidenhead, Berkshire, England

No Drawing. Filed Nov. 6, 1967, Ser. No. 680,990

Int. Cl. C07d *85/44, 99/02*

U.S. Cl. 260—307 **13 Claims**

A class of oxazole-2-polycarbon aliphatic monocarboxylic acids arylated at the 4- and/or 5-positions in the oxazole ring is described. Compounds of this class are active anti-inflammatory agents.

3,578,672

2-PROPARGYLAMINO-5-PHENYL-2-OXAZOLIN-4-ONE AND DERIVATIVES

Cheuk Man Lee and Bruce Wayne Horrom, Waukegan, Ill., assignors to Abbott Laboratories, North Chicago, Ill.

No Drawing. Filed Nov. 3, 1969, Ser. No. 873,688

Int. Cl. C07d *85/40*

U.S. Cl. 260—307 **12 Claims**

2-propargylamino-5-phenyl-2-oxazolin-4-one and derivatives thereof were found to be effective anti-depressants when administered in oral dosages of 0.5–20 mg./kg. to warm-blooded animals. The new compounds are prepared by condensing 2-amino-5-phenyl-2-oxazolin-4-one with propargylamine or the corresponding N- and/or 1-mono- or disubstituted alkyl derivatives thereof in the presence or absence of an inert reaction medium.

3,578,673

3-NITROARYL-4-HALOISOXAZOLES AND METHOD FOR PREPARING SAME

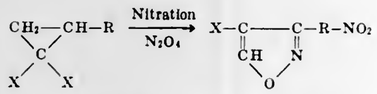
Herman A. Bruson, Woodbridge, and Howard L. Plant, Milford, Conn., assignors to Olin Corporation

No Drawing. Filed Sept. 30, 1968, Ser. No. 775,972

Int. Cl. C07d *85/22*

U.S. Cl. 260—307 **2 Claims**

The nitration of aryl-2,2-dihalocyclopropanes in the presence of higher oxides of nitrogen, principally dinitrogen tetroxide, gives 3-nitroaryl-4-haloisoxazoles by a new reaction which can be formulated as follows:



where R is a substituted aryl radical and X is chlorine or bromine. These new compounds are useful as fungicides, insecticides or herbicides, and as intermediates for dyestuffs.

3,578,674

DERIVATIVES OF TETRAZOLYL ALKANOIC ACIDS

Robert Thomas Buckler, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed Dec. 24, 1969, Ser. No. 888,069

Int. Cl. C07d *55/56*

U.S. Cl. 260—308 **5 Claims**

A series of bifunctional amide derivatives of omega-5-aryl-2-tetrazolylalkanoic acids. These compounds are useful as anti-inflammatory agents.

3,578,675

2-(3'-FLUORO-2'-NAPHTHYL)-BENZIMIDAZOLES

Dale R. Hoff, Cranford, and Louis H. Peterson, Woodbridge, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

No Drawing. Continuation of application Ser. No. 527,520, Feb. 15, 1966. This application June 9, 1969, Ser. No. 834,593

Int. Cl. C07d *49/38*

U.S. Cl. 260—309.2 **3 Claims**

Anthelmintically active benzimidazoles having an o-fluoronaphthyl group at the 2-position are prepared by a variety of processes including reaction of an o-nitroaniline or o-phenylenediamine with 3-fluoro-2-naphthoic acid or an equivalent thereof wherein the carboxylic acid radical is derivatized to a radical such as an ester, imidoester, amide, carbonyl halide or nitrile.

3,578,676

BENZIMIDAZOLE-2-CARBAMATES SUBSTITUTED ON THE BENZENE RING WITH AN ACYLOXY-ALKYL GROUP

George L. Dunn, Wayne, Pa., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.

No Drawing. Filed June 21, 1968, Ser. No. 738,842

Int. Cl. C07d *49/38*

U.S. Cl. 260—309.2 **9 Claims**

Benzimidazolyl carbamic acids and substituted on the benzene nucleus by carboxylated alkyl and alkoxy groups are disclosed as having activity against helminthiasis in animals. They may be prepared synthetically starting with an appropriate p-aminophenyl alkyl alcohol, proceeding through the alcoholic phenylene diamine to a hydroxyalkyl-2-carbomethoxyaminobenzimidazole.

3,578,677

PROCESS FOR PREPARING 2,3,5,9b-TETRAHYDRO-1H-IMIDAZO[2,1-a]ISOINDOL-5-OLS

Theodore S. Sulkowski, Narberth, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Filed May 24, 1968, Ser. No. 731,740

Int. Cl. C07d *49/34*

U.S. Cl. 260—309.7 **3 Claims**

This invention concerns 2,3,5,9b - tetrahydro - 1H - imidazo[2,1-a]isoindol - 5 - ols which are pharmacologically active as anorexiants and to a process for their preparation.

3,578,678

HYDROXYCARBAZOLE DIONES

Ruddy Littell, Rivervale, and George Rodger Allen, Jr., Old Tappan, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 9, 1969, Ser. No. 823,512

Int. Cl. C07d *27/68*

U.S. Cl. 260—315 **4 Claims**

The preparation of 4a,7,8,9a-tetrahydro-9a-hydroxycarbazole-3,4-(4H,6H)-diones by reaction of a 2-trifluoromethyl-1,4-benzoquinone with an amino or lower alkylamino-2-cyclohexen-1-one, is described. The compounds are physiologically active on the central nervous system and are useful as tranquilizers.

3,578,679

DECENYLSUCCINAMIC ACID AND IMIDE FROST AND FREEZE PREVENTATIVE COMPOUNDS

Paul J. Caruso, Philadelphia, Pa., and Pieter J. C. Kuiper, Riverside, Calif., assignors to Amchem Products, Inc., Ambler, Pa.

Filed Aug. 3, 1967, Ser. No. 658,179

Int. Cl. C07c *101/24;* **C07d** *27/10*

U.S. Cl. 260—326.5 **4 Claims**

Decenylsuccinamic acid and imide frost and freeze preventative compounds and method of use involving the

compounds N,N-dimethyl-decenylsuccinamic acid; N-dimethylamino - decenylsuccinamic acid; and N - dimethylamino-decenylsuccinimide. The application to crops of any of these compounds in sufficient amounts as present in aqueous solution by conventional spray equipment enables such crops to become resistant to the damaging effects of cold temperatures.

3,578,680

PHOTOCHROMIC COMPOUND

Hisatake Ono and Chiaki Osada, Saitama, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

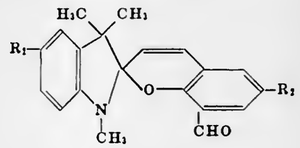
Filed June 10, 1968, Ser. No. 735,896

Claims priority, application Japan, June 9, 1967, 42/36,877

Int. Cl. C07d *27/38*

U.S. Cl. 260—326.11 **7 Claims**

A photochromic compound which exhibits the ability to change color under the influence of exciting radiation represented by the general formula



R_1 can be hydrogen, a halogen, a cyan group, an alkoxy group having from 1 to 8 carbon atoms and an alkyl group having from 1 to 8 carbon atoms. R_2 may be either hydrogen or a halogen.

Several specific compounds are also described in the disclosure.

3,578,681

SYNTHESIS OF THIOXANE

Clifford H. Mihm, deceased, late of Borger, Tex., by Adeline M. Mihm, administratrix, Borger, Tex., assignor to Phillips Petroleum Company

No Drawing. Filed Nov. 1, 1968, Ser. No. 773,978

Int. Cl. C07d *89/14*

U.S. Cl. 260—327 **3 Claims**

Thioxane is synthesized by reaction of beta-mercaptoethanol and 1,2-ethanedithiol employing a silicone catalyst. The silicone catalyst is a silicone rubber or grease on a solid support disposed in a column.

3,578,682

2,5-BIS-(2-N-LOWER ALKYL AMINO ISOPROPYL)-1,3,4-TRITHIOLANES AND PROCESS FOR THE PREPARATION THEREOF

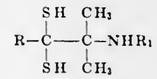
Arthur B. Ash, Lathrup Village, and Calvin L. Stevens and Anica Markovac, Detroit, Mich., assignors to Ash Stevens, Inc., Detroit, Mich.

No Drawing. Filed Mar. 20, 1969, Ser. No. 809,012

Int. Cl. A61k *27/00;* **C07d** *77/00*

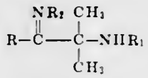
U.S. Cl. 260—327 **3 Claims**

Dimercapto compounds characterized as alpha,alpha-dimethyl-beta,beta-dimercapto-N-lower alkyl-(phenyl and substituted phenyl) ethylamines of the structural formula:



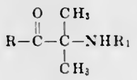
(I)

where R is phenyl and substituted phenyl and R_1 is lower alkyl containing 1 to 8 carbon atoms are described. Trithiolane condensation derivatives of the dimercapto compounds (I) prepared by oxidation with the elimination of hydrogen sulfide are also described. The dimercapto compounds (I) are generally prepared by reacting an alpha, alpha-dimethyl-beta-N-lower alkyl imine-(phenyl and substituted phenyl) ethylamine of the structural formula:



(III)

where R and R_1 are as in the dimercapto compounds (I) and R_2 is a lower alkyl group containing 1 to 8 carbon atoms with hydrogen sulfide in an inert anhydrous polar organic solvent for the imino compounds (III) at temperatures less than the decomposition temperature of the dimercapto compounds (I) and until (I) is formed and precipitates from the reaction mixture. The imino compounds (III) are preferably prepared by reacting a compound of the structural formula:



(II)

with a lower alkyl amine (R_2—NH_2) containing 1 to 8 carbon atoms. The product dimercapto compounds (I) and trithiolanes are particularly useful as antimalarials in mammals.

3,578,683

1,4-DISUBSTITUTED-1-HYDROXY-2,2,3-TRICYANO-1,2-DIHYDROXANTHONES

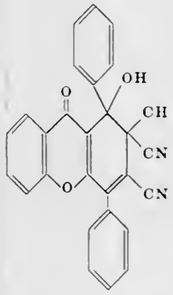
Myrna Loy, Philadelphia, Pa., and Kenneth Robert Huffman and Edwin Fisher Ullman, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Original application Dec. 14, 1964, Ser. No. 418,337. Divided and this application Nov. 2, 1967, Ser. No. 703,491

Int. Cl. C07d *7/44*

U.S. Cl. 260—335 **5 Claims**

Cyclohexadiene compounds, of which the following is exemplary.



These compounds are photochromic and may be used in information display or recording, and in other optical applications such as light filtering.

3,578,684
PERFLUORO-β-OXA-δ-VALEROLACTONE
James R. Throckmorton, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Filed Mar. 21, 1969, Ser. No. 809,397
Int. Cl. C07d *7/06*
U.S. Cl. 260—340.2 **5 Claims**

Perfluoro-β-oxa-δ-valerolactone, and a process for its preparation comprising heating a perfluorooxydiacetyl halide in the presence of an alkali metal fluoride, the compound being useful as a chemical intermediate.

3,578,685
3-(CYCLOPROPYLALKYL) - 2 - HYDROXY-1,4-NAPHTHOQUINONES AND THEIR PREPARATION
Sydney Archer, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.
No Drawing. Filed Apr. 26, 1968, Ser. No. 724,618
Int. Cl. C07c *49/66*
U.S. Cl. 260—396 **9 Claims**

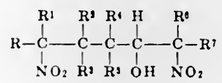
3 - [cyclopropyl - $(CH_2)_n$] - 2 - hydroxy - 1,4 - naphthoquinones, where *n* is an integer from 6 to 12 inclusive, having antimalarial properties, are prepared: (a) by heating 2 - hydroxy - 1,4 - naphthoquinone with a diacyl peroxide of the formula [cyclopropyl - $(CH_2)_n$ - $CO]_2O_2$ where *n* is 6 to 12 inclusive to produce said naphthoquinones where *n* is 6 to 12, respectively; (b) by oxidizing under alkaline conditions 3 - [cyclopropyl - $(CH_2)_n$]-2-hydroxy - 1,4 - naphthoquinone where *n* is 7 to 12 inclusive to produce the corresponding compound where *n* is 6 to 11, respectively; and (c) by the steps of oxidizing the corresponding 2-[cyclopropyl-$(CH_2)_n$] - 1 - naphthol where *n* is 6 to 12 inclusive to form 2 - [cyclopropyl-$(CH_2)_n$] - 1,4 - naphthoquinone, reacting the latter with a peroxide under alkaline conditions to form 2 - [cyclopropyl-$(CH_2)_n$] - 1,4 - naphthoquinone - 2,3 - oxide and hydrolyzing the 2,3 - oxide under acidic conditions to yield 2 - hydroxy - 3 - [cyclopropyl-$(CH_2)_n$] - 1,4 - naphthoquinone. Intermediates include compounds of the formula cyclopropyl - $(CH_2)_x$—COOH where *x* is an integer from 5 to 12 inclusive.

3,578,686
2-HYDROXY - 3-[(3,3,5-TRIMETHYLCYCLOHEXYL)-ALKYL] - 1,4-NAPHTHOQUINONES AND THEIR PREPARATION
Benjamin F. Tullar, Chatham, and Roman R. Lorenz, Greenbush, N.Y., assignors to Sterling Drug Inc., New York, N.Y.
No Drawing. Filed Apr. 26, 1968, Ser. No. 724,617
Int. Cl. C07c *49/00*
U.S. Cl. 260—396 **10 Claims**

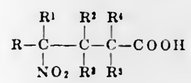
2-hydroxy - 3 - [(3,3,5-trimethylcyclohexyl)-$(CH_2)_n$]-1,4-naphthoquinones where *n* is an integer from 4 to 12 inclusive, having antimalarial properties, are prepared: (a) by heating 2-hydroxy-1,4-naphthoquinone with a diacyl peroxide of the formula [(3,3,5-trimethylcyclohexyl)-$(CH_2)_n$-$CO]_2O_2$ where *n* is 4 to 12 inclusive to produce said naphthoquinones where *n* is 4 to 12, respectively; (b) by oxidizing under alkaline conditions 2-hydroxy-3-[(3,3,5-trimethylcyclohexyl)-$(CH_2)_n$] - 1,4 - naphthoquinone where *n* is 5 to 12 inclusive to produce the corresponding compound where *n* is 4 to 11, respectively; and, (c) by the steps of oxidizing 2-[(3,3,5 - trimethylcyclohexyl)-$(CH_2)_n$]-1-naphthol where *n* is 4 to 12 inclusive to form 2 - [(3,3,5 - trimethylcyclohexyl) - $(CH_2)_o$] - naphthoquinone, reacting the latter with a peroxide under alkaline conditions to form 2 - [(3,3,5 - trimethylcyclohexyl)-$(CH_2)_n$] - 1,4-naphthoquinone-2,3-oxide and hydrolyzing the 2,3-oxide under acidic conditions to yield 2-hydroxy-3-[(3,3,5-trimethylcyclohexyl)-$(CH_2)_n$] - 1,4 - naphthoquinone. Novel intermediates include compounds of the formula (3,3,5 - trimethylcyclohexyl) - $(CH_2)_x$-COOH where *x* is an integer from 3 to 12 inclusive.

3,578,687
PROCESS FOR PRODUCING 4-NITROALKANOIC ACIDS
John M. Larkin, Hopewell Junction, and Kenneth L. Kreuz, Fishkill, N.Y., asssignors to Texaco Inc., New York, N.Y.
No Drawing. Filed Jan. 30, 1968, Ser. No. 701,562
Int. Cl. C09f *7/02;* **C07c** *51/28*
U.S. Cl. 260—404 **11 Claims**

A method for preparing a 4-nitroalkanoic acid by contacting a dinitroalcohol having at least 5 carbon atoms corresponding to the formula:



with an acidic oxidizing agent at a pH not exceeding 4 thereby forming a 4-nitroalkanoic acid of the formula:



The contemplated 4-nitroalkanoic acids are useful as plasticizers, bacteriocides, lubricant additives, fuel additives, anti-rust agents and as precursors for the preparation of 2-pyrrolidinone.

3,578,688
ISOMERIZATION OF ACIDS
Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
No Drawing. Filed May 3, 1968, Ser. No. 726,581
Int. Cl. C07c *3/14, 61/00, 53/00*
U.S. Cl. 260—405.6 **18 Claims**

A process for isomerization of carboxylic acids or anhydrides comprising contacting the acid or anhydride at elevated temperature in an essentially closed system with a complex catalyst comprising a Group VIII noble metal and a biphyllic ligand from the group consisting of organic phosphines, arsines and stibines, for a time sufficient to form an isomer of the acid or anhydride. The product acids and anhydrides are useful for preparation of a wide variety of products such as plasticizers, ester solvents, detergents, etc.

3,578,689
ESTER PURIFICATION PROCESS
Eugie A. Martin and Robert J. Fanning, Baton Rouge, La., assignors to Ethyl Corporation, New York, N.Y.
No Drawing. Filed Jan. 10, 1969, Ser. No. 790,471
Int. Cl. C07c *69/00*
U.S. Cl. 260—410.9 **18 Claims**

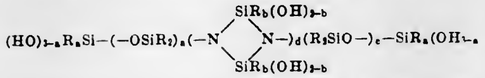
A process is disclosed whereby esters are purified to remove contaminants such as alcohol, fatty acid and residual esterification catalyst by a selected sequence of contacting operations under selected conditions while avoiding conditions found to be conducive to the formation of emulsions and gels and while avoiding conditions that require the manipulation of large quantities of various washing streams conducive to losses of esters.

3,578,690
PROCESS FOR PREPARING MOLYBDENUM ACID SALTS
Mitchell Becker, Teaneck, N.J., assignor to Halcon International, Inc.
No Drawing. Filed June 28, 1968, Ser. No. 740,975
Int. Cl. C08h *17/36*
U.S. Cl. 260—414 **9 Claims**

This invention relates to the preparation of molybdenum acid salts by directly reacting the carboxylic acid with a molybdenum compound while removing the water that is formed. These molybdenum acid salts are useful as catalysts in such processes as in the epoxidation of olefins.

3,578,691
ORGANIC 1,3,2,4-DIAZADISILETIDINES AND PROCESS
Walter Fink, Zurich, Switzerland, assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Nov. 25, 1968, Ser. No. 778,798
Int. Cl. C07f *7/02;* **C07d** *103/02*
U.S. Cl. 260—448.2 **5 Claims**

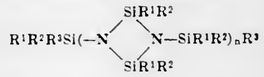
Organic 1,3,2,4-diazadisiletidines of the formula



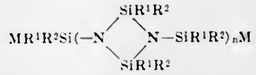
and process for making by gradually adding the corresponding halo compound wherein the hydroxyl groups are replaced by reactive halogen atoms to a mixture or solution comprising water and an acid-binding agent.

3,578,692
1,3-DISILYL-1,3,2,4-DIAZADISILETIDINES AND PROCESS
Walter Fink, Zurich, Switzerland, assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Nov. 25, 1968, Ser. No. 778,841
Int. Cl. C07f *7/02*
U.S. Cl. 260—448.2 **11 Claims**

The invention is a process for preparing 1,3-bis-disilyl-1,3,2,4-diazadisiletidines of the formula



where *n* is 1 to 100, by reacting a compound of the formula

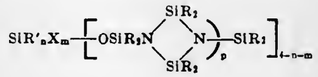


where M is a metal atom linked through an oxygen atom, with a compound of the formula XR^3 where X is a reactive halogen atom, and new compounds of the first formula above where *n* is an integer of 1 to 100.

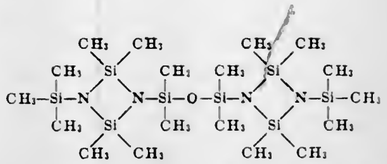
The compounds prepared in this manner find utility as temperature resistant products.

3,578,693
CYCLODISILAZANYLSILOXANES
Walter Fink, Zurich, Switzerland, assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Dec. 6, 1968, Ser. No. 781,955
Int. Cl. C07f *7/02*
U.S. Cl. 260—448.2 **3 Claims**

The invention relates to new compounds having the formula



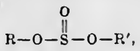
and



useful as temperature resistant functional fluids, such as heat transfer fluids, hydraulic fluids and lubricants.

3,578,694
ALKYL CARBALKOXYALKYL AND ALKYL ALKANOYLOXYALKYL SULFITES
Rupert A. Covey, Wolcott, and Bogislav von Schmeling and Charles E. Crittendon, Hamden, Conn., assignors to Uniroyal, Inc., New York, N.Y.
No Drawing. Filed Dec. 26, 1967, Ser. No. 693,117
Int. Cl. A01n *9/14;* **C07c** *137/00*
U.S. Cl. 260—456 **7 Claims**

Novel sulfite esters having the formula



wherein R is an alkyl or monohaloalkyl group having up to 12 carbon atoms and R′ is a carbalkoxy alkyl or alkanoyloxyalkyl group or a monohalosubstituted derivative thereof having 3 to 9 carbon atoms, useful as herbicides, insecticides and nematocides.

3,578,695
OLEFINIC NITRILES BY THE CATALYTIC OXIDATION OF OLEFINS USING HYDROGEN CYANIDE
Ernest C. Milberger, Solon, and Wilfrid G. Shaw, Lyndhurst, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio
No Drawing. Filed July 26, 1967, Ser. No. 655,993
Int. Cl. C07c *121/32, 121/00*
U.S. Cl. 260—465.3 **8 Claims**

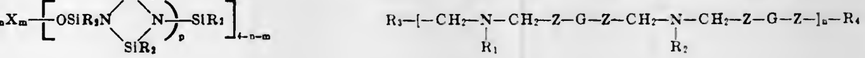
The instant application deals with a process for the manufacture of monoolefinically unsaturated aliphatic nitriles by the catalytic oxidation of olefin using cyanide and a molecular oxygen-containing gas, but no ammonia.

3,578,696
METHOD FOR PRODUCING MALONONITRILE
Joachim Hillard Blanck, 260—16 69th Ave., Glen Oaks, N.Y. 11004, and Martin Prince, 58 Darlington Drive, Wayne, N.J. 07470
No Drawing. Filed Aug. 5, 1968, Ser. No. 749,936
Int. Cl. C07c *121/22, 121/02*
U.S. Cl. 260—465.3 **11 Claims**

Malononitrile is produced by direct vapor phase reaction of allene and ammonia in the presence of oxygen at a temperature in the range of 650° F. to 1000° F. and preferably in the presence of a catalyst such as bismuth phosphomolybdate or bismuth phosphotungstate on a catalytic support. Water may be advantageously used to be premixed with the reactants before passing over the catalyst to effect the vapor phase reaction.

3,578,697
CHELATING POLYMER
Nelson S. Marans, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed Oct. 10, 1968, Ser. No. 766,645
Int. Cl. C07c *97/02*
U.S. Cl. 260—465.4 **14 Claims**

In abstract this invention is directed to a process for preparing a final polymer having the formula



wherein (i) n is 2–4,000; (ii) each of R_1 and R_2 is separately a member selected from the group consisting of

$$-CH_2COOH,\ -CH_2CH_2COOH,\ -CH_2\underset{\underset{O}{\|}}{C}-NH_2$$

and

$$-CH_2CH_2-\underset{\underset{O}{\|}}{C}-NH_2$$

the mole ratio of carboxyl groups to amide groups being about 1:0.1–10; (iii) G is an alkylene group having about 2–12 carbon atoms; (iv) R_3 is a member selected from the group consisting of

$$-\underset{\underset{O}{\|}}{C}-OH,\ -\underset{\underset{O}{\|}}{C}-\underset{\underset{H}{|}}{N}-G-OH,\ -\underset{\underset{O}{\|}}{C}-\underset{\underset{H}{|}}{N}-G-NH_2,\ -\underset{\underset{O}{\|}}{C}-O-G-NH^2$$

and

$$-\underset{\underset{O}{\|}}{C}-O-G-OH$$

(v) R_4 is a member selected from the group consisting of

$$-CH_2-\underset{\underset{R_5}{|}}{N}-CH_2-\underset{\underset{O}{\|}}{C}-OH,\ -CH_2-\underset{\underset{R_5}{|}}{N}-CH_2-Z-G-OH$$

and

$$-CH_2-\underset{\underset{R_5}{|}}{N}-CH_2-Z-G-NH_2$$

wherein R_5 is a member selected from the group consisting of

$$-CH_2\underset{\underset{O}{\|}}{C}-NH_2,\ -CH_2\underset{\underset{O}{\|}}{C}-OH,$$

$$-CH_2CH_2\underset{\underset{O}{\|}}{C}-NH_2,\ \text{and}\ -CH_2CH_2\underset{\underset{O}{\|}}{C}-OH$$

(vi) Z is a member selected from the group consisting of

$$-\underset{\underset{O}{\|}}{C}-\underset{\underset{H}{|}}{N}-\ \text{and}\ -\underset{\underset{O}{\|}}{C}-O-$$

comprising reacting a dihydric alcohol or an amino alcohol, or a diamine with an acid having the formula $NC—A—N{=}(CH_2COOH)_2$ wherein A is an alkylene group having 1–2 carbon atoms to form a first intermediate polymer, treating the first intermediate polymer with hot aqueous alkali to form a second intermediate polymer, and treating the second aqueous polymer with a strong mineral acid to form the final polymer which is recovered, all as recited hereinafter.

3,578,698
PREPARATION OF ESTERS FROM OLEFINS IN THE PRESENCE OF AN OXIME

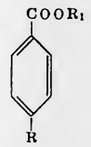
Percy Hayden, Norton-on-Tees, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Dec. 15, 1966, Ser. No. 601,868
Claims priority, application Great Britain, Dec. 24, 1965, 54,840/65; May 5, 1966, 19,853/66; Dec. 24, 1966, 28,201/66
Int. Cl. C07c *67/04*
U.S. Cl. 260—475 **18 Claims**

There is provided a process for the oxidation of an unsaturated organic compound in the presence of a palladium catalyst and a nucleophilic compound. The oxidation is carried out in the presence of an oxime or in a solution to which has been added a nitrate, nitrite, nitrosyl, nitro or nitroso compound. The reaction is thus accomplished in the essential absence of halide ions.

3,578,699
p-(1,5-DIMETHYL - 1,5 DIHALOHEXYL) BENZOIC ACID ESTERS, COMPOUNDS FOR COMBATTING INSECT PESTS OF THE GENUS DYSDERCUS

Frantisek Sorm and Milos Suchy, Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia
Filed June 20, 1968, Ser. No. 738,397
Claims priority, application Czechoslovakia, June 21, 1967, 4,548/67
Int. Cl. C07c *69/76;* **A01n** *9/24*
U.S. Cl. 260—476 **5 Claims**

Insect pests of the genus Dysdercus are combatted by contacting insects, larvae or eggs of the genus Dysdercus with an effective amount of a compound of the formula



wherein R is 1,5-dimethyl-1,5-dihalohexyl wherein dihalohexyl is dichlorohexyl or dibromohexyl and R_1 is alkyl with one or two carbon atoms or an aralkyl with up to 9 carbon atoms. The above compound is produced by reacting a compound of the formula

wherein R_1 is an alkyl group with one or two carbon atoms or an aralkyl group with up to 9 carbon atoms, and R_2 is a 1,5-dimethylhexa-1,4-dienyl group, with a hydrogen halide selected from the group consisting of HCl and HBr, and recovering the thus-produced compound.

3,578,700
PROCESS FOR PREPARING POLY (BETA-LACTONE) PREPOLYMERS

Arie Klootwijk, deceased, late of Amsterdam, Netherlands, by Johanna Maria Klootwijk, representative, Purmerend, and Willem Bergwerf and Willem M. Wagner, Amsterdam, Netherlands, assignors to Shell Oil Company, New York, N.Y.
No Drawing. Filed Mar. 29, 1968, Ser. No. 717,472
Int. Cl. C08g *17/017*
U.S. Cl. 260—484 **7 Claims**

Poly(beta-lactone) prepolymers having a molecular weight of from about 200 to about 10,000 and which are especially suitable as initiators for the polymerization of poly(beta-lactones) are prepared by reacting a beta-lactone and preferably an alpha,alpha-dialkyl-beta-propiolactone with a nucleophilic agent as hereinafter more fully described such as the tertiary phosphines, in a molar ratio of 20:1 to 1:40.

3,578,701
FLUORINATED ACIDS AND ESTERS

Kenneth C. Smeltz, Graylyn Crest, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Original application July 26, 1967, Ser. No. 656,076, now Patent No. 3,478,116, dated Nov. 11, 1969. Divided and this application Feb. 28, 1969, Ser. No. 803,469
Int. Cl. C07c *55/08, 69/62*
U.S. Cl. 260—485 **11 Claims**

Perfluoroalkyl-terminated alkyl malonic acids and esters of the formula $(R_f—R')_aCH_{2-a}(COOR)_2$ prepared from the corresponding malonic acid ester and $R_f—R'—Z$. The esters are useful to prepare perfluoroalkyl-terminated alkyl-1,3-propanediols of the formula

$$(R_f—R')_aCH_{2-a}(CH_2OH)_2$$

by reduction. The esters and diols can be used to prepare polyesters and polyurethanes which are in general useful as fabric coatings to impart oil- and water-repellency thereto.

3,578,702
PROCESS FOR PRODUCING α,β-UNSATURATED ORGANIC COMPOUNDS

Thomas Carter Snapp, Jr., Alden E. Blood, and Hugh John Hagemeyer, Jr., Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Dec. 3, 1965, Ser. No. 511,327
Int. Cl. C07c *69/52, 69/54, 121/30*
U.S. Cl. 260—486 **7 Claims**

A process for producing α,β-unsaturated organic compounds which comprises contacting formaldehyde and a saturated organic ester, aldehyde, ketone or nitrile in the vapor phase in the presence of one or more inorganic oxides of rare earth metals of the lanthanide series impregnated on an inert support such as silica gel.

3,578,703
PROCESS FOR PRODUCING METHYL FORMATE FROM ALKALI OR ALKALINE EARTH FORMATE

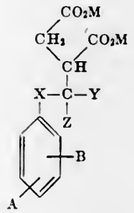
Erwin F. Schoenbrunn, Ridgefield, and Edward H. Durell, Monroe, Conn., assignors to Escambia Chemical Corporation, Pace, Fla.
No Drawing. Filed Apr. 23, 1968, Ser. No. 723,603
Int. Cl. C07c *67/00*
U.S. Cl. 260—488 **9 Claims**

A process for the production of methyl formate from alkali or alkaline earth formate by reaction with at least an equivalent quantity of methanol and strong acid in the presence of sufficient water to keep the reactant formate in solution, followed by distillation of the methyl formate produced. Sodium formate and sulfuric acid are preferred reactants. Methanol may be recovered by increasing the distillation temperature to at least the boiling point of methanol.

3,578,704
SUCCINATES SUBSTITUTED IN THE ALPHA POSITION BY ALKYL BENZENE SULFONATES

Stephen E. McGuire and Eugene F. Kennedy, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.
No Drawing. Filed Aug. 1, 1969, Ser. No. 846,928
Int. Cl. C07c *143/52*
U.S. Cl. 260—507 **3 Claims**

Novel surface active agents are provided having the general formula:



wherein X is a linear alkyl group containing from about 0 to about 35 carbon atoms, with the provision that when X contains 0 carbon atoms the phenyl nucleus is attached directly to the carbon atom bearing the succinyl group; Y is hydrogen or a linear alkyl group containing from about 1 to about 35 carbon atoms; Z is hydrogen or a linear alkyl group containing from about 1 to about 35 carbon atoms; A is hydrogen or a linear or branched alkyl group containing from about 1 to about 15 carbon atoms; M is a cation selected from the group consisting of Li, Na, K, Rb, Cs, Ca, Mg, NH_4 and substituted ammonium; B is hydrogen or $—SO_3M$, with M being defined as before; and the sum of the carbon atoms X, Y, Z and A being from about 8 to about 35.

3,578,705
PROCESS FOR THE PREPARATION OF HOMOPHTHALIC ACID

Norman L. Wendler, Summit, Harry L. Slates, Florham Park, and Stuart Weber, Colonia, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Filed July 26, 1967, Ser. No. 656,001
Int. Cl. C07c *65/00*
U.S. Cl. 260—521 **10 Claims**

3,5-diloweralkoxy homophthalic acids are prepared from 5,7-diloweralkoxy-1-indanones via the corresponding 2-oximo-1-indanones and 1,2-indandiones and are employed as intermediates in the total synthesis of d,l-Zearalenones.

3,578,706
REMOVAL OF BROMINE-CONTAINING IMPURITIES FROM AQUEOUS ACETIC ACID

Ferdinand List and Helmut Alfs, Marl, Germany, assignors to Chemische Werke Huels A.G., Marl, Germany
No Drawing. Filed Oct. 18, 1967, Ser. No. 676,022
Claims priority, application Germany, Oct. 27, 1966, C 40,534
Int. Cl. C07c *63/02*
U.S. Cl. 260—524 **7 Claims**

In the working-up of acetic-acid-containing byproducts mixtures derived from processes directed to the liquid-phase air oxidation of alkyl aromatics in the presence of bromide anions, the improvements of treating such mixtures with metals or inorganic compounds thereof having electrochemical potentials ranging from magnesium to iron in order to convert organically bound bromide to bromide anions, and then subjecting the reaction mixture to ion exchange to remove substantially all the bromide ions, thereby eliminating the corrosiveness of the mixture and permitting the utilization of considerably less expensive materials of construction for the distillation system and other apparatus.

3,578,707
PRODUCTION OF UNSATURATED ALIPHATIC ACIDS

James Robert Bethell and David James Hadley, Epsom Downs, Surrey, England, assignors to BP Chemicals (U.K.) Limited, London, England
No Drawing. Continuation-in-part of application Ser. No. 497,496, Oct. 18, 1965, which is a division of application Ser. No. 4,221, Jan. 25, 1960. This application July 19, 1967, Ser. No. 654,372
Claims priority, application Great Britain, Feb. 17, 1959, 5,396/59; Apr. 15, 1959, 12,881/59
Int. Cl. C07c *57/04*
U.S. Cl. 260—530 **7 Claims**

Process for producing unsaturated aliphatic acids such as acrylic acid and methacrylic acid from the corresponding aldehyde or compounds giving rise to them under the reaction conditions by passing the starting material over a catalyst comprising cobalt molybdate and optionally a quantity of tellurium or an oxide of tellurium.

3,578,708
METAL SEQUESTRANT
Ronald H. Carlson, Lewiston, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.
No Drawing. Filed Nov. 2, 1967, Ser. No. 680,040
Int. Cl. C07c *101/26;* **C07f** *9/50;* **C11d** *3/36*
U.S. Cl. 260—534 **12 Claims**

This invention relates to novel compounds useful as a sequestrant, and as a stabilizer for hydrogen peroxide, against contaminating catalyst ions such as cupric, ferric and manganous ions which cause decomposition of hydrogen peroxide for example.

Although the novel compounds included within this invention are of broad scope, representative compounds include: hexasodium tris(N,N-diacetatoaminomethyl)phosphine; trisodium tris(N-acetatoaminomethyl)phosphine; tris(N,N - diacetoaminomethyl)phosphine; tetrasodium mono(hydroxymethyl)bis(N,N - diacetatoaminomethyl) phosphine; and disodium bis(hydroxymethyl)N,N-diacetatoaminomethyl phosphine.

3,578,709
PREPARATION OF ALKALI METAL SALTS OF NITRILOTRIACETIC ACID
John J. Bishop, Northford, Conn., and Albert W. Jache, Wauwatosa, Wis., assignors to Olin Corporation
No Drawing. Filed Aug. 28, 1968, Ser. No. 755,837
Int. Cl. C07c *101/20*
U.S. Cl. 260—534 **3 Claims**

Alkali metal salts of nitrilotriacetic acid are advantageously produced by heating triethanolamine in the presence of a zinc oxide or a cadmium oxide catalyst at 150° to 300° C. with a mixture of sodium hydroxide and a minor proportion of potassium hydroxide.

3,578,710
DIHALOCYCLOPROPANE DERIVATIVES
Herman A. Bruson, Woodbridge, and Howard L. Plant, Milford, Conn., assignors to Olin Corporation
No Drawing. Filed Sept. 30, 1968, Ser. No. 763,910
Int. Cl. C07c *143/70*
U.S. Cl. 260—543 **2 Claims**

Novel halosulfonyl derivatives are prepared by reacting a halosulfonic acid with a 1,1-dihalo-2-phenylcyclopropane compound. These derivatives are useful as pesticides and, in addtion, may be utilized in preparing a variety of valuable pharmaceutical products.

3,578,711
N-(3,4-DICHLOROPHENYL) - 3-[N'-(3,4-DICHLOROPHENYL)CARBAMOYL]METHYL - 2,2 - DIMETHYLCYCLOBUTANE CARBOXAMIDE
Theodore Largman, Morristown, N.J., and Peter E. Newallis, Leawood, Kans., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed July 18, 1968, Ser. No. 745,664
Int. Cl. C07c *103/33*
U.S. Cl. 260—558 **1 Claim**

N - (3,4 - dichlorophenyl) - 3 - [N'-(3,4-dichlorophenyl) carbamoyl]methyl - 2,2-dimethylcyclobutanecarboxamide is prepared by reaction of 3,4-dichloroaniline with pinic acid chloride in the presence of base. The product is useful as an insecticide and chemosterilant.

3,578,712
BIS(SUBSTITUTED PHENYL)ACETALS
Albert J. Frey, Essex Fells, and Mario G. Buzzolini, Morristown, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Filed Feb. 7, 1969, Ser. No. 797,661
Int. Cl. C07c *103/30*
U.S. Cl. 260—559 **2 Claims**

The compounds are para-substituted bis-phenylacetals of N-amidinoglyoxylamide, and non-toxic acid addition salts thereof, e.g., bis(p-chlorophenyl)acetal of N-amidinoglyoxylamide, are useful theapeutically. They are obtainable by reaction of an appropriate lower alkyl ester of bis(p-halophenoxy)acetic acid with guanidine.

3,578,713
PROCESS FOR PREPARING TOLUIDINES
John A. Scott, North Haven, Conn., assignor to Olin Corporation
No Drawing. Filed Nov. 22, 1968, Ser. No. 778,297
Int. Cl. C07c *85/10*
U.S. Cl. 260—580 **7 Claims**

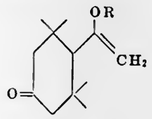
The process for preparing nitrotoluidines by reacting an aromatic nitro compound with carbon monoxide in the presence of a catalyst comprised of a mixture of an oxide of copper and an oxide of manganese.

3,578,714
PROCESS FOR PREPARING ANILINE FROM PHENOL
Joseph L. Russell, Ridgewood, N.J., assignor to Halcon International, Inc.
No Drawing. Filed Oct. 28, 1968, Ser. No. 771,342
Int. Cl. C07c *85/06*
U.S. Cl. 260—581 **4 Claims**

A process for preparing aniline by the direct amination of phenol with ammonia in the vapor phase in the presence of a solid, heterogeneous catalyst. It has been discovered that significant process improvements are obtained if the phenol feed to the reaction is vaporized in the absence of substantial amounts of ammonia.

3,578,715
NOVEL DIKETONES AND DERIVATIVES THEREOF
Bernard Pierre Corbier and Paul Jose Teisseire, Grasse, France, assignors to S.A. des Etablissements Roure-Bertrand Fils & Justin Dupont, Grasse, France
No Drawing. Filed Oct. 10, 1966, Ser. No. 585,259
Claims priority, application Switzerland, Oct. 14, 1965, 14,216/65
Int. Cl. C07c *49/30*
U.S. Cl. 260—586 **3 Claims**

Novel diketones, illustrative of which are lower enol-ethers such as those of the formula



where R represents a lower alkyl group, and process for preparing the same wherein certain particular intermediate ketones are reacted with lower alkylorthoformates in the presence of an acid catalyst.

3,578,716
PROCESS FOR AROMATIC SUBSTITUTION
Robert E. Robinson, Columbia, S.C., assignor to National Distillers and Chemical Corporation, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 631,917, Apr. 19, 1967, which is a continuation-in-part of applications Ser. No. 282,559, Ser. No. 282,594, and Ser. No. 282,595, all filed May 23, 1963. This application Mar. 21, 1969, Ser. No. 809,406
Int. Cl. C07c *25/06, 25/18*
U.S. Cl. 260—650 **12 Claims**

Substituted aromatic derivatives are prepared by reacting an aromatic compound with a Group VIII platinum metal salt wherein the substituent introduced is derived from the anion portion of said Group VIII platinum metal salt.

3,578,717
PERFLUOROALKYL VINYL SULFONES AND PROCESS FOR PRODUCING SAME
Ronald A. Mitsch, St. Paul, and Robert J. Koshar, Lincoln Township, Washington County, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Filed May 29, 1968, Ser. No. 732,865
Int. Cl. C07c *147/04;* **C08f** *13/00*
U.S. Cl. 260—607 **4 Claims**

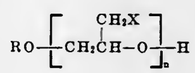
Perfluoroalkyl vinyl sulfones, $CF_3SO_2CH{=}CH_2$ and higher, are provided which are homopolymerized to oligomers in the presence of tertiary amine basic catalysts.

3,578,718
PROCESS FOR THE PREPARATION OF ISOMERIC MIXTURES OF DI-THIO-BENZENE COMPOSED ESSENTIALLY OF THE PARA ISOMER
Max Schmidt, Wurzburg, Germany, assignor to Research Corporation, New York, N.Y.
No Drawing. Filed May 17, 1968, Ser. No. 729,915
Claims priority, application France, May 19, 1967, 107,109
Int. Cl. C07c *149/32*
U.S. Cl. 260—609 **4 Claims**

A process for producing di-thio-benzene is disclosed, wherein polyphenylene-disulfide is subjected to the action of a reducing agent, and the resultant compound is acidified to produce the free mercaptan.

3,578,719
SURFACE ACTIVE AGENTS
Gregoire Kalopissis, Paris, and Guy Vanlerberghe, Montjay-la-Tour, France, assignors to Societe Anonyme dite: L'Oreal, Paris, France
No Drawing. Continuation-in-part of application Ser. No. 544,095, Apr. 21, 1966. This application Nov. 29, 1968, Ser. No. 780,300
Claims priority, application Luxembourg, Apr. 23, 1965, 48,458; Nov. 22, 1965, 49,902; Apr. 6, 1966, 50,850; France, Dec. 1, 1967, 130,713
Int. Cl. C07c *41/00, 43/04*
U.S. Cl. 260—611 **9 Claims**

Non-ionic surface active agents having the formula



in which R is a lipophile group, X is OH or halogen and *n* is 2–10.

3,578,720
REDUCTION OF AROMATIC NITROCOMPOUNDS
David Dodman and John Mathers, Woolley, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Nov. 14, 1968, Ser. No. 775,895
Claims priority, application Great Britain, Nov. 24, 1967, 53,636/67; Mar. 29, 1968, 15,392/68
Int. Cl. C07c *81/02, 107/06*
U.S. Cl. 260—647 **14 Claims**

Reducing aromatic nitrocompounds to nitroso-, azoxy- or azo-compounds with carbon monoxide in presence of a catalyst comprising oxygenated compounds of at least two heavy metals.

3,578,721
PROCESS FOR REDUCING THE FORMATION OF POLYMER ATTENDANT THE PYROLYSIS OF TETRAFLUOROETHYLENE
Maurice Joseph Couture, Parkersburg, W. Va., and Hans M. B. Gerner and Hugh H. Gibbs, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Dec. 14, 1967, Ser. No. 690,398
Int. Cl. C07c *17/26, 17/28, 23/06*
U.S. Cl. 260—648 **6 Claims**

The pyrolysis of tetrafluoroethylene to higher molecular weight perfluorocarbon compounds, e.g., hexafluoropropylene, is accompanied by polymer formation which, according to the present invention, is suppressed by intimately contacting the pyrolyzate before it cools sufficiently for polymerization to occur with such compounds as HCl, HF, KF or NaF.

3,578,722
CHEMICAL PROCESS
Robert Neil Fraser, Horsham, England, assignor to BP Chemicals (U.K.) Limited, London, England
No Drawing. Filed Oct. 28, 1968, Ser. No. 771,271
Claims priority, application Great Britain, Nov. 16, 1967, 52,207/67
Int. Cl. C07c *3/50*
U.S. Cl. 260—671 **7 Claims**

1:2:4:5 tetra-alkyl benzenes are produced from the reaction of propylene and xylene in mole ratio less than 2.

3,578,723
ISOMERIZATION AND DISPROPORTIONATION OF AROMATIC HYDROCARBONS
Emmerson Bowes, Media, and John J. Wise, Philadelphia, Pa., assignors to Mobil Oil Corporation
No Drawing. Filed Apr. 18, 1968, Ser. No. 722,162
Int. Cl. C01b *33/28;* **C07c** *3/58, 5/22*
U.S. Cl. 260—672 **12 Claims**

A new and unusual family of crystalline zeolites identified as zeolite ZSM–4 are used as catalysts for the isomerization and disproportionation of aromatic hydrocarbons.

3,578,724
MIGRATION AND ISOMERIZATION OF ACETYLENES
Andre Jules Hubert, Brussels, Belgium, assignor to Union Carbide Corporation
No Drawing. Filed Mar. 4, 1968, Ser. No. 709,942
Int. Cl. C07c *5/22, 11/12, 11/22*
U.S. Cl. 260—678 **4 Claims**

Process for the migration of acetylenic bonds and a process for the isomerization of hydrocarbons containing acetylenic bonds to hydrocarbons containing conjugated unsaturation, by contacting a compound containing one or two acetylenic bonds with potassium amide on alumina. The unsaturated compounds produced by the process of the invention are useful as ultraviolet light absorbers, as cross-linking agents for polyolefinic elastomers, and as intermediates in the synthesis of new compounds.

3,578,725
NOVEL CATALYST SYSTEM FOR ISOMERIZING HYDROCARBONS
Donald E. Jost, Media, Edward J. Janoski, Havertown, and Abraham Schneider, Philadelphia, Pa., assignors to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Aug. 9, 1968, Ser. No. 751,378
Int. Cl. C07c *5/28*
U.S. Cl. 260—683.75 **9 Claims**

In the isomerization of C_4–C_7 paraffins with an aluminum halide catalyst, it has been found that higher yields are obtainable and at lower temperatures, when the reaction is carried out in the presence of both a support and a solvent for the aluminum halide catalyst.

3,578,726
CONDENSATION METHOD FOR MAKING MULTIPLE SEQUENCE ORGANOPOLYSILOXANE BLOCK POLYMERS
Edgar E. Bostick, Scotia, and William A. Fessler, Albany, N.Y., assignors to General Electric Company
No Drawing. Filed Oct. 13, 1969, Ser. No. 866,002
Int. Cl. C08g *31/34, 47/02*
U.S. Cl. 260—825 **5 Claims**

A condensation method is provided for making branched and multiple sequence block polymers. A silane having at least two hydrolyzable radicals attached to silicon is employed to couple active polydiorganosiloxane having at least one terminal alkali metal silanolate radical. The polydiorganosiloxane can be in the form of a binary or ternary block and the alkali metal silanolate is complexed with hexamethylphosphoramide to provide a stable non-randomizing activated site. The multiple sequence block polymers exhibit improved physical properties over the corresponding binary or ternary block polymers.

3,578,727
TWO-ROD HOT-MELT ADHESIVES FROM POLYEPOXIDES OR POLYURETHANE SYSTEMS
William R. Battersby, Lexington, Robert P. Follett, Lowell, Timothy D. MacGrandle, Lynn, Conrad Rossitto, Andover, and Paul Taylor, North Andover, Mass., assignors to United Shoe Machinery Corporation, Flemington, N.J.
No Drawing. Continuation-in-part of application Ser. No. 699,357, Jan. 22, 1968. This application July 1, 1968, Ser. No. 741,266
Int. Cl. C08g *45/12*
U.S. Cl. 260—830 **8 Claims**

An adhesive or stiffening agent supply comprising at least two flexible slender rods of synthetic polymer resin of different mutually reactive compositions adapted to be melted in predetermined length ratio to supply molten material for mixing to give a curing adhesive or stiffening agent composition for application to a surface.

3,578,728
LIQUID UNSATURATED POLYESTERS AND POLYESTER URETHANES CONTAINING CROSSLINKED PARTICLES OF THE SAME RESINS
Wendell A. Ehrhart, Hellam, and Clarence E. Rohrer, Lititz, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.
No Drawing. Filed Nov. 18, 1968, Ser. No. 784,955
Int. Cl. C08g *41/04*
U.S. Cl. 260—859 **8 Claims**

Blends of particles of cross-linked unsaturated polyester resins and fluid unsaturated polyester resins. The blends possess properties unique to unsaturated polyester resins in that they may be readily processed using a variety of techniques not commonly associated with unsaturated polyester resins and the blends are readily curable to form useful articles. The cross-linked particles used in forming the blends are conveniently produced by subjecting the unsaturated polyester resin to mastication during or after polymerization.

3,578,729
THERMOPLASTIC POLYESTER MOLDING COMPOSITIONS
Ludwig Brinkmann and Walter Herwig, Frankfurt am Main, and Harald Cherdron, Wiesbaden, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed July 11, 1968, Ser. No. 743,925
Claims priority, application Germany, July 20, 1967, F 53,013
Int. Cl. C08g *39/10*
U.S. Cl. 260—873 **15 Claims**

Molding compositions which can be processed thermoplastically are prepared from a mixture of linear saturated polyesters and α-olefin-acrylic acid ester copolymers and are distinguished by a high impact strength.

3,578,730
THERMOPLASTIC POLYESTER-POLY-3-METHYL BUTENE-1 MOULDING COMPOSITIONS
Walter Herwig and Ludwig Brinkmann, Frankfurt am Main, and Klaus-Dieter Asmus, Hofheim, Taunus, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Sept. 26, 1968, Ser. No. 763,012
Claims priority, application Germany, Oct. 7, 1967, P 16 94 199.4
Int. Cl. C08f *29/10;* **C08g** *39/20, 51/58*
U.S. Cl. 260—873 **10 Claims**

Thermoplastic moulding compositions comprising linear saturated polyesters and poly-3-methylbutene-1 of which at least 80% of the particles are 10 microns or less and from which moulded articles of high dimensional stability can be made.

3,578,731
LINEAR POLYMERIC PHOSPHORUS-CONTAINING ESTERS
Franklin E. Mange, Rudolf S. Buriks, and Patrick M. Quinlan, St. Louis, Mo., assignors to Petrolite Corporation, Wilmington, Del.
No Drawing. Filed Dec. 1, 1967, Ser. No. 687,127
Int. Cl. C07f *9/38;* **A01n** *9/36;* **B01d** *17/04*
U.S. Cl. 260—929 **6 Claims**

Linear polyesters of a phosphorus-containing acid and a diol as illustrated by a polyester having repetitive units of the formula:

$$-X-\overset{\overset{\displaystyle X}{\uparrow}}{\underset{\underset{\displaystyle Z}{\downarrow}}{P}}-B-$$

where X is oxygen or sulfur; B is a diol residue; Z is hydrogen in the case of a phosphite ester i.e. H; a hydrocarbon or a substituted hydrocarbon group in the case of a phosphonate ester i.e. R; an oxyhydrocarbon or a substituted oxyhydrocarbon group in the case of a phosphate ester i.e. —OR; a thiohydrocarbon or a substituted thiohydrocarbon group in the case of thiophosphate ester i.e. —SR.

The preferred polyester has repeating units of the formula

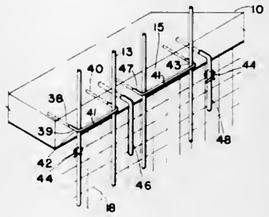
$$-O-\overset{\overset{\displaystyle O}{\uparrow}}{\underset{\underset{\displaystyle Z}{\downarrow}}{P}}-(OA)_n-$$

where OA is the residue of an alkylene oxide or a substituted alkylene oxide; *n* is an integer, for example 1–300 or more, such as about 2–250, for example about 3–200, but advantageously about 5–130, and Z is hydrogen, a substituted group (R), for example, alkyl, aryl, cycloalkyl, alkaryl, aralkyl, heterocyclic including substituted derivatives thereof, etc.; alkoxy or aryloxy group (OR) for example methoxy, propoxy, isopropoxy, 2-ethylhexoxy, etc., phenoxy, etc.

These polyesters are employed as demulsifiers as well as for other uses.

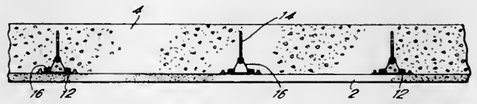
3,578,732
METHOD OF FORMING BUILDING WALLS
Graham C. Lount, 744 South Drive, and William D. Lount, 101 Grenfell Blvd., both of Winnipeg, Manitoba, Canada
Filed Oct. 21, 1968, Ser. No. 769,344
Int. Cl. E04b *1/16;* **E04g** *21/00*
U.S. Cl. 264—34 **12 Claims**

This method of forming walls is primarily for multistoried, column supported buildings and consists of placing a plurality of vertically situated spaced and parallel tendons or cables through the wall opening, then prestressing same, and then attaching a wire grid or equivalent to the tendons or cables. Under certain circumstances a form is then placed in spaced and parallel relationship from the



tendons or cables and the grid and then a wall material that sets up by chemical action is sprayed or trowelled through and around the tendons or cables and the grid so that the said tendons or cables and grid are fully embedded in the material.

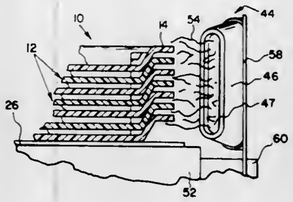
3,578,733
METHOD FOR MAKING JOINTED CONCRETE STRUCTURES
John Hurst, London, England, assignor to W. R. Grace & Co., New York, N.Y.
Filed May 23, 1968, Ser. No. 731,374
Claims priority, application Great Britain, May 26, 1967, 24,716/67
Int. Cl. E04b *1/16*
U.S. Cl. 264—35 **8 Claims**



Concrete is cast with a dummy joint sealed by a flexible water stop embedded by keying formations into the concrete, by a method in which a crack is formed as the dummy joint, a crack-inducing body, e.g., a piece of wood being fixed in position, e.g., by spring clips, opposite the centre line of each water stop. The invention also includes a novel assembly of a water stop and a spring clip for holding the crack-inducing body.

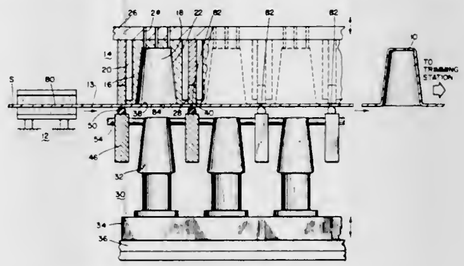
3,578,734
METHOD FOR TREATING THE FLANGES OF CONTAINERS
Charles Elbert Woodard, 14 Elizabeth St., South Windsor, Conn. 06074, and Richard James Morcom, 44 High Farms Road, West Hartford, Conn. 06107
Filed Nov. 19, 1968, Ser. No. 777,030
Int. Cl. B29c *25/00;* **B29f** *5/00*
U.S. Cl. 264—80 **12 Claims**

Containers of synthetic plastic material having an outwardly extending flange about at least a portion of their periphery are stacked in nested relationship with a relatively small spacing between their flanges and are subjected to a flame treatment by an angularly disposed



flame along the outer edge of the flange to eliminate jagged edges and whiskers. The heating produces a bead of increased thickness at the finage edge to provide a smooth surface.

3,578,735
METHOD AND APPARATUS FOR MOLDING PLASTIC ARTICLES
Sidney Cholmar and Robert H. Peters, Bloomfield, Conn., assignors to Monsanto Company, St. Louis, Mo.
Filed Dec. 30, 1968, Ser. No. 787,654
Int. Cl. B29c *17/03, 17/04*
U.S. Cl. 264—89 **6 Claims**



Method and apparatus for simultaneously forming a plurality of articles from thermoplastic sheet material. The sheet from which the articles are formed is clamped against a mold containing rows of mold cavities. The clamping is within the periphery of the sheet solely in a direction perpendicular to that of advancement of the sheet such that it is uninterrupted across the sheet intermediate each row of cavities. The clamping member has a reciprocatably mounted frame having laterally extending ribs joined to sides of the frame. The ribs are aligned opposite a front face of the mold between the rows of cavities therein.

ERRATUM

For Class 219—107 see:
Patent No. 3,578,165

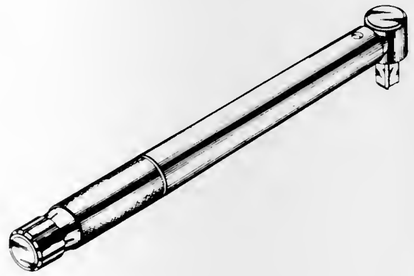
DESIGNS

MAY 11, 1971

220,674
BATHING-CAP
Carlos Capella Nogue, Calle Roman Macaya 18, Barcelona 6, Spain
Filed Jan. 5, 1970, Ser. No. 20,769
Claims priority, application Spain July 12, 1969
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—237

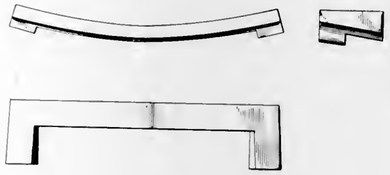
220,675
NECKTIE OR THE LIKE
Louis J. Schultze, 102 E. Oak St., Chicago, Ill. 60611
Continuation-in-part of design application Ser. No. 19,239, Sept. 22, 1969. This application July 29, 1970, Ser. No. 24,212
Term of patent 14 years
Int. Cl. D2—*06*
U.S. Cl. D2—351

220,676
TORQUE WRENCH
Bosko Grabovac, Altadena, Calif. (% Consolidated Devices, Inc., 818 E. Broadway, San Gabriel, Calif. 91776)
Filed May 22, 1969, Ser. No. 17,280
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—24

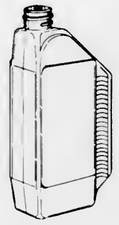


220,677
HANDSAW
Arne Erkers, Hallebergsvagen 18, Bromma, Sweden
Filed Feb. 10, 1970, Ser. No. 21,395
Claims priority, application Sweden Sept. 26, 1969
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—96

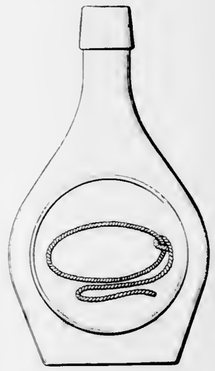
220,678
HANDLE
William J. Horgan, Jr., Pittsburgh, Pa., assignor to Blumcraft of Pittsburgh, Pittsburgh, Pa.
Filed Oct. 8, 1969, Ser. No. 19,457
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—166



220,679
BOTTLE OR THE LIKE
Henry Finkel, Westmount, Quebec, Canada, assignor to Quality Oil Corporation, Montreal, Quebec, Canada
Filed May 12, 1970, Ser. No. 22,941
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—44

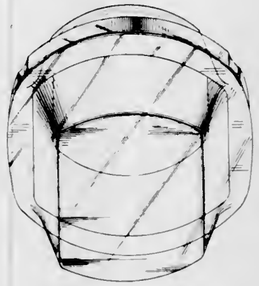


220,680
BOTTLE
Van H. Neher, Mauricetown, N.J., assignor to Wheaton Glass Company, Millville, N.J.
Filed Feb. 18, 1970, Ser. No. 21,477
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—62



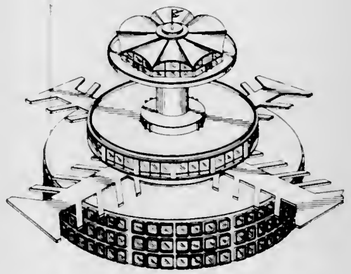
220,681
BOTTLE
Robert H. Knies, Fullerton, Calif., assignor to Hunt-Wesson Foods, Inc., Fullerton, Calif.
Filed Aug. 5, 1970, Ser. No. 24,315
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—103

220,682
COMBINED PACKAGING TRAY AND COVER
Kenneth W. Artz, Mohnton, Pa., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 17, 1968, Ser. No. 15,026
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—219

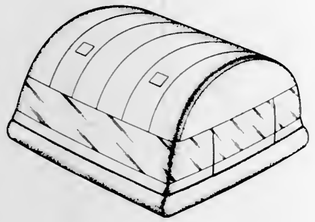


220,683
PACKAGING TRAY FOR A LOBSTER
Allan Ray Clouston, 6845 Monkland Ave., Montreal 28, Quebec, Canada
Filed Jan. 20, 1970, Ser. No. 21,010
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—222

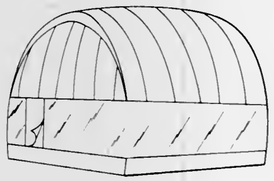
220,684
BUILDING STRUCTURE INCLUDING UNDER-WATER LIVING ACCOMMODATIONS
William S. Page, 12862 Sylvan St., Garden Grove, Calif. 92641, and Lauren W. Anderson, Newport Beach, Reid A. Kawai, Pasadena, and Paul B. Kraus, Sunset Beach, Calif., and George C. Oyama, Mount Clemens, Mich.; said Anderson, Kawai, Kraus, and Oyama assignors to said Page
Filed Jan. 21, 1970, Ser. No. 21,016
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



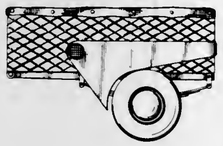
220,685
AIR-SUPPORTED STRUCTURE
James Scott Stineman, 615 W. Civic Center Drive, Suite 215, Santa Ana, Calif. 92701
Filed Feb. 17, 1970, Ser. No. 21,474
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



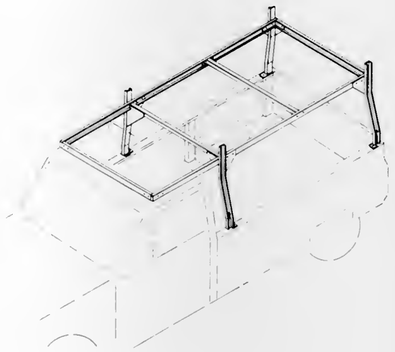
220,686
AIR-SUPPORTED STRUCTURE
James Scott Stineman, 615 W. Civic Center Drive, Suite 215, Santa Ana, Calif. 92701
Filed May 11, 1970, Ser. No. 22,911
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



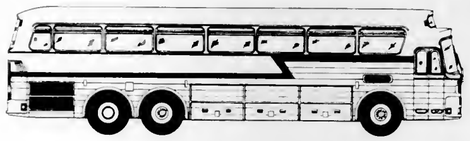
220,687
CAMPING AND UTILITY TRAILER
Nathan E. Spiese, East Petersburg, Pa., assignor to Wheel Mate Corporation, East Petersburg, Pa.
Filed Dec. 12, 1969, Ser. No. 20,472
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D14—3



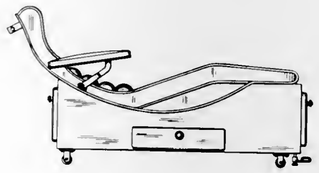
220,688
TRUCK RACK
James G. Zulim, 911 King St., Santa Cruz, Calif. 95060, and Louis J. Zulim, 604 Townsend Ave., Aptos, Calif. 95003
Filed Mar. 26, 1970, Ser. No. 22,061
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—3



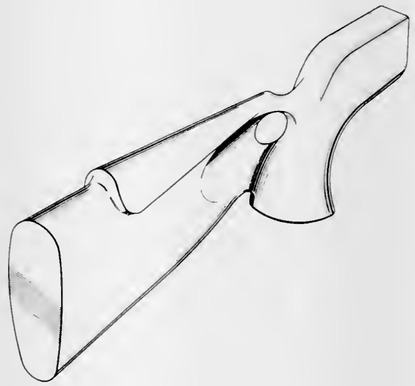
220,689
MOTOR COACH
Maurice E. Moore, 315 Continental Ave., Dallas, Tex. 75207
Filed Apr. 3, 1970, Ser. No. 22,229
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D14—3



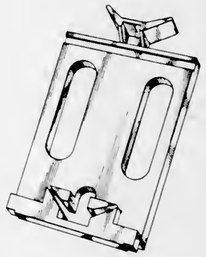
220,690
CHAIR
Arthur Charles Ferro, St. Louis, Mo., assignor to Contour Chair-Lounge Co., Inc., St. Louis, Mo.
Filed Mar. 16, 1970, Ser. No. 21,920
Term of patent 14 years
Int. Cl. D6—*02*
U.S. Cl. D15—11



220,691
GUNSTOCK GRIP
Charles R. Peterson, 7839 Craner Ave., Sun Valley, Calif. 91352
Filed Mar. 3, 1969, Ser. No. 16,005
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—6

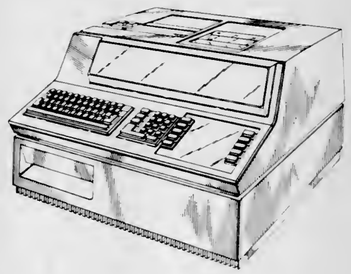


220,692
MODULE EXTENDER
Ira Morris, Framingham, Mass. (% Digital Equipment Corp., 146 Main St., Maynard, Mass. 01754)
Filed Apr. 27, 1970, Ser. No. 22,653
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D26—1

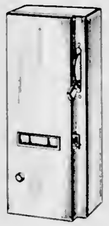


220,693
DATA TERMINAL OR SIMILAR ARTICLE
Pierre L. Crease, Kettering, and James C. Kaufman, Dayton, Ohio, and Dean E. Wilson, Glendale, Mo., assignors to The National Cash Register Company, Dayton, Ohio
Filed Apr. 30, 1970, Ser. No. 22,731
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

220,694
DATA TERMINAL OR SIMILAR ARTICLE
Pierre L. Crease, Kettering, Donald L. Forsythe, Dayton, and Dean E. Wilson, Kettering, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Filed Apr. 30, 1970, Ser. No. 22,732
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

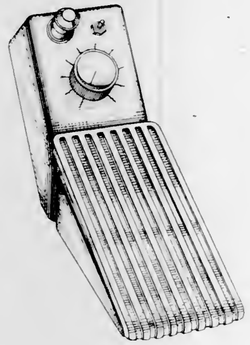


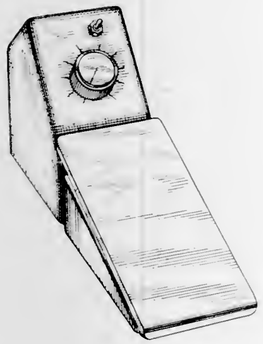
220,695
CONTROL ENCLOSURE
Stephen Lazzo III, Park Forest, Ill., assignor to General Electric Company
Filed Oct. 24, 1969, Ser. No. 19,699
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



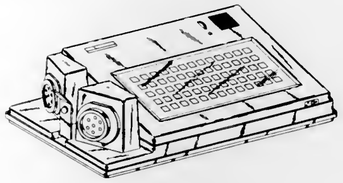
220,696
CONTROL ENCLOSURE
Stephen Lazzo III, Park Forest, Ill., assignor to General Electric Company
Filed Oct. 24, 1969, Ser. No. 19,700
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

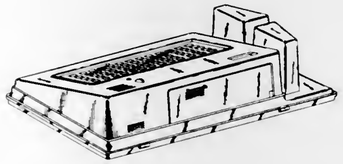
220,697
FISHING MOTOR FOOT PEDAL CONTROL
Ralph C. Osborn, Bloomington, Ill., assignor to Osborn Engineering Corporation
Filed Oct. 27, 1969, Ser. No. 19,746
Term of patent 7 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



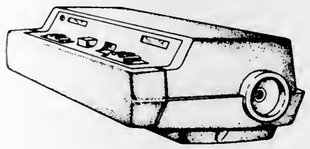


220,698
TELEPHONE TERMINAL
Henry Kapper, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 31, 1969, Ser. No. 20,928
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14

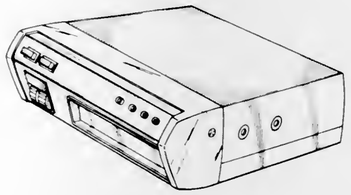




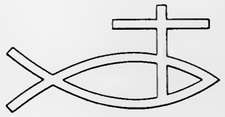
220,699
CONTROL UNIT FOR A TWO-WAY RADIO OR SIMILAR ARTICLE
Martin C. Stessel, Schaumberg, Rudolph W. Krolopp, Palatine, and Karl Miklas, Park Ridge, Ill., assignors to Motorola, Inc., Franklin Park, Ill.
Filed Feb. 24, 1970, Ser. No. 21,630
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



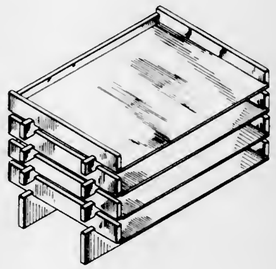
220,700
STEREO-TAPE PLAYER
Robert P. Maniaci, Downey, Calif., assignor to California Auto Radio Inc., Downey, Calif.
Filed Mar. 9, 1970, Ser. No. 21,798
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



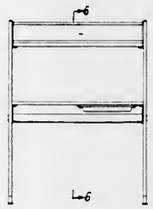
220,701
CHRISTIAN MEDALLION OR SIMILAR ARTICLE
Joseph A. Honzik, 2120 34th St., Two Rivers, Wis. 54241
Filed Oct. 28, 1969, Ser. No. 19,756
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D29—23



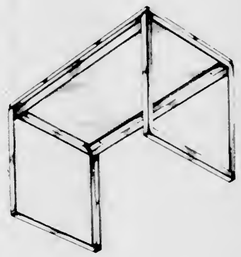
220,702
SHELF UNIT FOR STORING BLUE PRINTS OR SIMILAR ARTICLES
Frank R. Sweet, Jr., 56 Fayerweather, Cambridge, Mass. 02138
Filed Oct. 30, 1968, Ser. No. 14,226
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—2



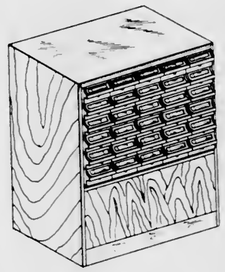
220,703
COMBINED DESK AND BOOK RACK
Yoshio Deguchi, Tokyo, and Fumio Yanaguchi, Yokohama, Japan, assignors to Okamura Manufacturing Company Limited, Yokohama, Japan
Filed Dec. 11, 1969, Ser. No. 20,449
Claims priority, application Japan June 23, 1969
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D33—7



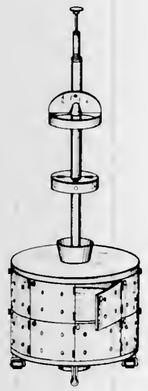
220,704
TABLE
Edward James Kramer, Edmonds, Wash., assignor to Magna Design, Inc., Lynnwood, Wash.
Filed Dec. 12, 1969, Ser. No. 20,479
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D33—14



220,705
FILING CABINET
Charles M. Huck, New Brunswick, N.J., assignor to Estey Corporation, Red Bank, N.J.
Original design application Sept. 25, 1968, Ser. No. 13,713, now Patent No. 215,307, dated Sept. 23, 1969. Divided and this application Sept. 18, 1969, Ser. No. 19,205
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D33—19



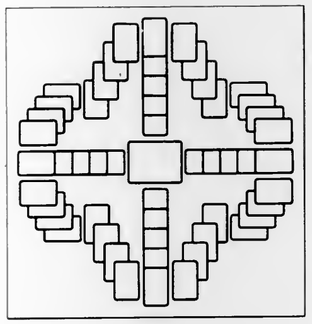
220,706
COMBINED CABINET AND ACCESSORY TRAY UNIT
Essie M. Reid, 12 Rita Lane, North Syracuse, N.Y. 13212
Filed Nov. 7, 1969, Ser. No. 19,979
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—19



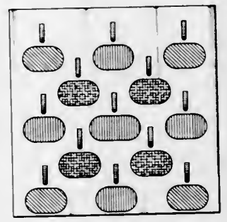
220,707
COMBINED LIQUID AND CUP DISPENSER
Rodney J. Brott, 1340 Yale Ave. NW., Canton, Ohio 44703
Filed Jan. 21, 1970, Ser. No. 21,019
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—26

220,708
COMBINED LIQUID AND CUP DISPENSER
Rodney J. Brott, 1340 Yale Ave. NW., Canton, Ohio 44703
Filed Jan. 21, 1970, Ser. No. 21,020
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—26

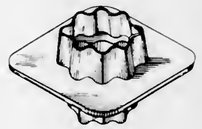
220,709
GAME BOARD
William B. Burke, Springfield, Mass., asignor to Milton Bradley Company, Springfield, Mass.
Filed July 24, 1969, Ser. No. 18,368
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



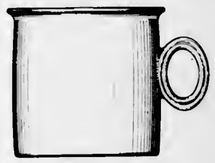
220,710
RING TOSS GAME TARGET BOARD
Elwood T. Stricklin, Lima, Peru (374 Santa Isabel Ave., Costa Mesa, Calif. 92627)
Filed Aug. 13, 1969, Ser. No. 18,673
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



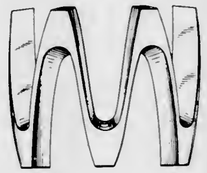
220,711
FOOD CUTTER
James B. Swett, Barrington, R.I., assignor to Dart Industries, Inc., Los Angeles, Calif.
Filed Feb. 18, 1970, Ser. No. 21,478
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—1



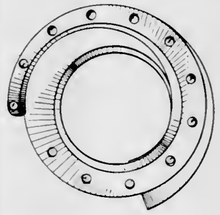
220,712
CUP
Neils Refsgaard, Ishoj per Taastrup, Denmark, assignor to Dansk Designs, Ltd., Mount Kisco, N.Y.
Filed Jan. 26, 1970, Ser. No. 21,085
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—9

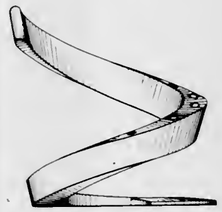


220,713
CANDELABRA
Jens H. Quistgaard, Copenhagen, Denmark, assignor to Dansk Designs, Ltd., Mount Kisco, N.Y.
Filed Mar. 9, 1970, Ser. No. 21,805
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—2



220,714
CANDELABRA
Bertil Vallien, Afors, Sweden, assignor to Dansk Designs, Ltd., Mount Kisco, N.Y.
Filed May 26, 1970, Ser. No. 23,150
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—2



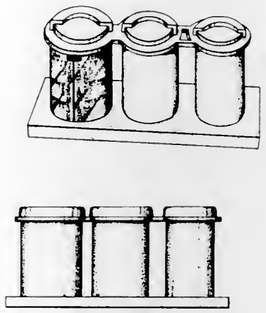


220,715
COMBINED LAMP SHADE AND MIRROR
Aime Trudeau, 227 NE. 26th St., Miami, Fla. 33127
Filed Jan. 14, 1970, Ser. No. 20,921
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—16

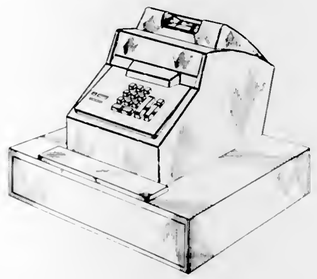
220,716
DESIGN FOR A LAMP BASE
Vine B. Miller, 1414 S. Shipley St., Muncie, Ind. 47302
Filed Apr. 13, 1970, Ser. No. 22,419
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—20

220,717
HIGH INTENSITY LAMP
Dan M. Andre, 8843 Kostner Terrace, Skokie, Ill. 60076
Filed Apr. 29, 1970, Ser. No. 22,713
Term of patent 3½ years
Int. Cl. D26—*02*
U.S. Cl. D48—20

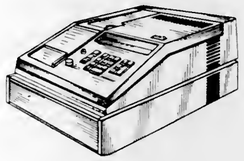
220,718
COMBINED COIN HOLDER AND CALENDAR
David M. Pailet, 3239 Bishop St., Cincinnati, Ohio 45220
Filed Apr. 10, 1969, Ser. No. 16,683
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D52—4



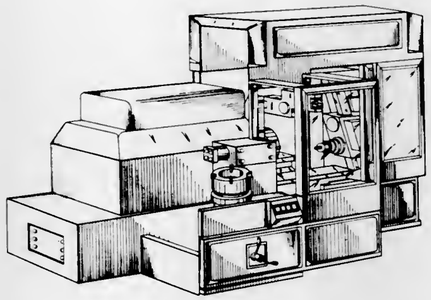
220,719
CASH REGISTER OR SIMILAR ARTICLE
Claudio G. Gomez and Francisco Kvapil, Buenos Aires, Argentina, assignors to The National Cash Register Company, Dayton, Ohio
Filed Apr. 9, 1970, Ser. No. 22,351
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D52—4



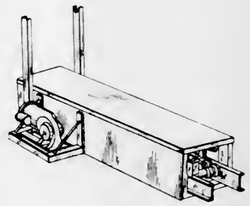
220,720
CASH REGISTER
Isao Kitai, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan
Filed Apr. 16, 1970, Ser. No. 22,458
Claims priority, application Japan Dec. 5, 1969
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D52—4



220,721
TURNING CENTER
Brooks Stevens, Fox Point, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.
Filed Jan. 22, 1970, Ser. No. 21,037
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D54—6

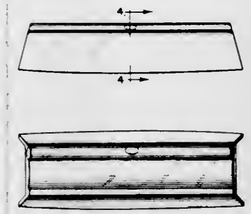


220,722
ROLL FORMING MACHINE FOR MAKING GUTTERS
Gary A. Knudson, 1280 Willow Lane, Golden, Colo. 80401
Filed June 23, 1969, Ser. No. 17,816
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D55—1



220,723
RADIO RECEIVER
Edward Abbo, 6 Ronald Drive, Monsey, N.Y. 10952
Filed June 2, 1970, Ser. No. 23,258
Term of patent 3½ years
Int. Cl. D14—*03*
U.S. Cl. D56—4

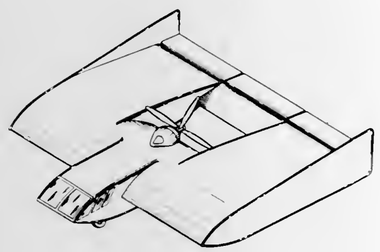
220,724
HAND MAGNIFIER
St. Barth Alaska, 3811 S. Scoville Ave., Berwyn, Ill. 60402
Filed Mar. 3, 1969, Ser. No. 16,016
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D57—1



220,725
DESIGN FOR A PAIR OF SPECTACLES
Roger L. McCracken, Chili, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Sept. 23, 1969, Ser. No. 19,260
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D57—1

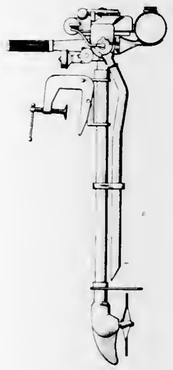
220,726
PORTABLE TYPEWRITER
John Cuccio, Westport, Conn., assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Feb. 20, 1970, Ser. No. 21,563
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

220,727
AIRCRAFT
Ralph V. Sawyer, 45432 Leatherwood, Lancaster, Calif. 93534
Filed Jan. 5, 1970, Ser. No. 20,767
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D71—1

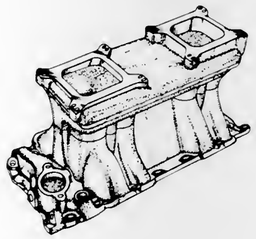


220,728
BOW-MOUNTED STEERING CONSOLE FOR BOATS
Joseph G. Cox, Jr., 2611 Gilmer Road, Longview, Tex. 75601
Filed Mar. 2, 1970, Ser. No. 21,682
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D71—1

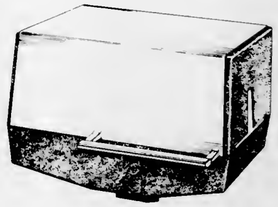
220,729
BOAT ENGINE
William P. Kitovich, Chicopee, Mass., assignor to K & P Products Inc., Chicopee Falls, Mass.
Filed June 30, 1969, Ser. No. 17,964
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D71—1



220,730
HIGH RAM AUTOMOTIVE INTAKE MANIFOLD
Philip Weiand, 2737 San Fernando Road, Glendale, Calif. 90065
Filed Dec. 15, 1969, Ser. No. 20,513
Term of patent 14 years
Int. Cl. D15—*01*
U.S. Cl. D77—1



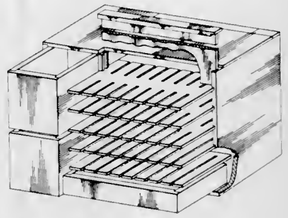
220,731
GAS GRILL
Lewis H. Herr, Lansdale, Pa., assignor to Caloric Corporation, Topton, Pa.
Filed Dec. 19, 1969, Ser. No. 20,568
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D81—10



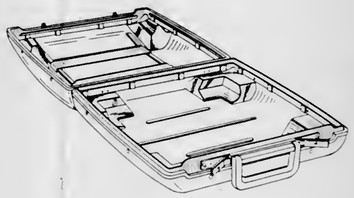
220,732
NIPPLE SEAT FOR BABY BOTTLE
Michael C. Ritsl, 7950 SW. 16th St., Miami, Fla. 33155
Filed Mar. 23, 1970, Ser. No. 22,026
Term of patent 14 years
Int. Cl. D24—*05*
U.S. Cl. D83—8

220,733
JEWEL CASE
Kenneth G. Niblack, 395 Linwood Ave., Buffalo, N.Y. 14209
Filed Oct. 1, 1968, Ser. No. 13,825
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1

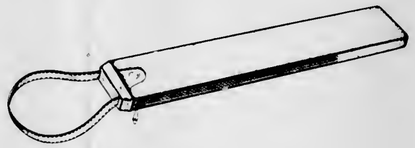
220,734
FISHING TACKLE BOX
Gary Wallazy, 14860 Lyons, Livonia, Mich. 48154
Filed Jan. 16, 1970, Ser. No. 20,951
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



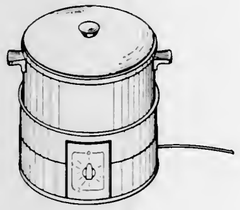
220,735
TYPEWRITER CARRYING CASE
Ettore Sottsass, Jr., Milan, Italy, assignor to Ing. C. Olivetti & C. S.p.A., Ivrea, Turin, Italy
Filed Feb. 11, 1970, Ser. No. 21,401
Claims priority, application Italy Aug. 20, 1969
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—1



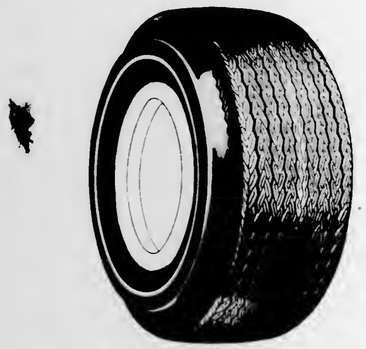
220,736
COMBINED UMBRELLA AND SHEATH
Manfred Bremshey, 350 Simcoe Ave., Mount Royal, Quebec, Canada
Continuation-in-part of design application Ser. No. 14,442, Nov. 13, 1968. This application Dec. 29, 1969, Ser. No. 20,659
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D87—1



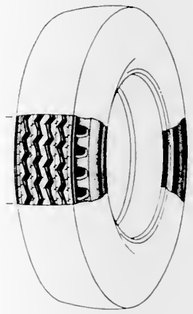
220,737
VEGETABLE PEELER
Louis H. Loeffler, 1247 Minerva Ave., West Islip, N.Y. 11795
Filed Feb. 17, 1970, Ser. No. 21,473
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D89—1



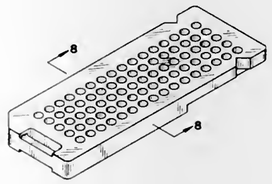
220,738
TIRE
Robert W. Floyd, Atwater, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.
Filed Oct. 8, 1969, Ser. No. 19,465
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D90—20



220,739
TIRE
Eric C. Bartlett, Birmingham, England, assignor to The Dunlop Company Limited, Birmingham, England
Filed Apr. 1, 1970, Ser. No. 22,171
Claims priority, application Great Britain Oct. 23, 1969
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D90—20



220,740
INFORMATION PLATE FOR A HOSPITAL PATIENT
Roger V. Larson, Murray, Utah, assignor to Bio-Logics, Inc., Salt Lake City, Utah
Filed Aug. 7, 1969, Ser. No. 18,573
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D96—13



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 11TH DAY OF MAY, 1971

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Alden, Gardner E.; and Herterick, George M., to Avco Corporation. Furnace support for resinoid preforms. 3,578,301, Cl. 263-47.
Alexander, Carl V., to Schlumberger Technology Corporation. Apparatus for plugging well bores with hardenable fluent substances. 3,578,079, Cl. 166-187.
Alexander, Gordon E.: *See—*
Sirois, Louis L.; Winer, Albert A.; Alexander, Gordon E.; and Page, Arthur P.,3,578,408.
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Alexeeva, Alevtina Vasilievna: *See—*
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Allen, Chester W. Pneumatic tire dismounting apparatus. 3,578,058, Cl. 157-1.17
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Amano, Hiroyuki; Iwano, Haruhiko; Shirasu, Kazuo; and Ohi, Reiichi, to Fuji Shashin Film Kabushiki Kaisha. Color photographic processing with water soluble amines and salts thereof. 3,578,453, Cl. 96-60.
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Anderson, Charles G., to United States of America, Atomic Energy Commission. Method of making means for venting helium from a radioisotope container. 3,578,442, Cl. 75-206.
Anderson, Edwin G. Telescopic and pivotal cover assembly for open bed vehicles. 3,578,378, Cl. 296-137.
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Cho, Boong Y.; and Anderson, Larry B.,3,578,406.
Anderson, Lawrence: *See—*
Kriesel, Marshall S.; Anderson, Lawrence; and Ericson, Paul E.,3,578,275.
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Andress, Harry J., Jr.; and Ashjian, Henry, to Mobil Oil Corporation. Liquid hydrocarbon compositions containing reaction products of an amine and methyl vinyl ether-maleic anhydride copolymers as antistatic agents. 3,578,421, Cl. 44-62.
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Arai, Masakazu: *See—*
Sakata, Rikita; Masuda, Kohei; Uchigaki, Taku; and Arai, Masakazu,3,578,527.

Arai, Masayuki, to Lyric Kabushiki Kaisha. Paper bag of simplified structure adapted to be retained in each of the opened and the folded configurations. 3,578,236, Cl. 229-55.

Archer, Sydney, to Sterling Drug Inc. 3-(Cyclopropylalkyl)-2-hydroxy-1,4-naphthoquinones and their preparation. 3,578,685, Cl. 260-396.

Arita, Hiroshi: *See—*
Takano, Masatoshi; Arita, Hiroshi; and Omori, Hayao,3,577,909.

Armington, Alton F.; and O'Connor, John J., to United States of America, Air Force. Apparatus for growth of large crystals in gels. 3,578,414, Cl. 23-273.

Armour, Donald F., to Monsanto Company. Container with closure. 3,578,223, Cl. 222-521.

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Jones, William H., 3,578,283.

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Aron, Jerome: *See—*
Hardy, John F.; Rivin, Donald; and Aron, Jerome,3,578,635.

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Watson, Donald W.; and Artelt, Herbert C., Jr.,3,578,316.

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Ash, Arthur B.; Stevens, Calvin L.; and Markovac, Anica, to Stevens, Ash, Inc. 2,5-Bis (2-N-lower alkyl amino isopropyl)-1,3,4-trithiolanes and process for the preparation thereof. 3,578,682, Cl. 260-327.

Ashjian, Henry: *See—*
Andress, Harry J., Jr.; and Ashjian, Henry,3,578,421.

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Washall, Thomas A., 3,578,568.

Attaway, Thomas J. Automatic electro-pneumatic control apparatus for car washing system. 3,578,001, Cl. 134-45.

Atwood, Harold Thomas. Vacuum seal for dough dividers. 3,578,218, Cl. 222-383.

Auriol, Jean G. M., to Regie Nationale des Usines Renault, and Automobiles Peugeot. Multi-disk clutches. 3,578,119, Cl. 192-70.14

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Smith, Charles W., Jr., 3,578,201.

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Awrath, Rudolf, to Bayerische Motoren Werke Aktiengesellschaft. Self-locking differential gear, especially for motor vehicles. 3,577,888, Cl. 74-711.

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Aylott, Eric Victor, to Eylure Limited. Artificial fingernails for wear. 3,578,158, Cl. 206-65.

Babbitt, John H., Jr.; Butterfield, Max E.; Nelson, Grant L.; Piper, Hugh V.; and Stark, Sheldon L., to Caterpillar Tractor Company. Tilt over roll protection frame with power tilting means. 3,578,377, Cl. 296-102.

Bader, Karl F., Jr. Subdermal tendon implant. 3,577,837, Cl. 3-1.

Badguerahanian, Leon; and Kemp, Thomas, to Produits Chimiques Pechiney Saint-Gobain. Preparation of vinyl polymers. 3,578,649, Cl. 260-92.8

Baessler, Lee R., to Hametrics Corporation. Method and appartus for automatically screening variably recurrent waveforms such as an electrocardiac signal. 3,577,983, Cl. 128-2.06

Bahat, Dov; and Chu, Gordon P. $K_2BaO\text{-}Al_2O_3\text{-}SiO_2$ glass-ceramic materials. 3,578,470, Cl. 106-39.

Baker, Arthur Kenneth. Apparatus for producing reinforced plastics material articles. 3,578,529, Cl. 156-393.

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Ballester, Jose F. Corner suspendable pail and hanger. 3,578,205, Cl. 220-85.

Ban, Itsuki. Automatic playing apparatus utilizing plurality of endless tape cartridges. 3,578,334, Cl. 274-4.

Ban, Itsuki. Sound track changeover device for automatic playing apparatus having a plurality of endless tape cartridges. 3,578,335, Cl. 274-4.

Ban, Itsuki. Automatic playing apparatus utilizing plurality of endless tape cartridges. 3,578,336, Cl. 274-4.

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Barrere, Clem A., Jr., to Continental Oil Company. Method for cooling heated adsorbent beds. 3,577,867, Cl. 55-62.

Barton, Hugh Perry, to Barton, R. P., & Company. Machine for size-grading walnuts. 3,578,161, Cl. 209-86.

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Battersby, William R.; Follett, Robert P.; MacGrandle, Timothy D.; Rossitto, Conrad; and Taylor, Paul, to United Shoe Machinery Corporation. Two-rod hot-melt adhesives from polyepoxides or polyurethane systems. 3,578,727, Cl. 260-830.

Bauer, Ignaz; Riedle, Rudolf; and Nitzsche, Siegfried, to Wacker-Chemie G.m.b.H. Molded articles and coatings based on organopoly- siloxanes. 3,578,490, Cl. 117-138.8

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Baxter, George, to Moore Business Forms, Inc. Process for making dual walled microcapsules. 3,578,605, Cl. 252-316.

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Beardsley, Herbert P., to Du Pont de Nemours, E. I., and Company. Vinyl acetate-ethylene copolymer aqueous paint compositions. 3,578,618, Cl. 260-17.

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Bertin, Jean Henri, to Bertin & Cie. Arrangement for confining a volume of fluid. 3,577,927, Cl. 104-23.

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Betz, Andrew J., Jr., to United States of America, Navy. Acceleration and pressure responsive fluid valve. 3,578,006, Cl. 137-38.

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Burke, Richard L., to Colgate-Palmolive Company. Stabilization of N-chloro-imides. 3,578,599, Cl. 252-102.
Burke, Richard L., to Colgate-Palmolive Company. Stabilization of N-chloro-imides. 3,578,600, Cl. 252-102.
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LIST OF DESIGN PATENTEES

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Lazzo, Stephen, III, to General Electric Co. Control enclosure. 220,696, 5-11-71, Cl. D26—13.
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Stineman, James S. Air-supported structure. 220,686, 5–11–71, Cl. D13—1.
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CLASSIFICATION OF PATENTS

ISSUED MAY 11, 1971

NOTE.—First number, class; second number, subclass; third number, patent number

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3– 1	3.577.837	
8– 10	3.578.386	
.1	3.578.387	
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23– 2	3.578.390	
20	3.578.395	
22	3.578.391	
	3.578.392	
48	3.578.396	
86	3.578.393	
87	3.578.394	
97	3.578.397	
113	3.578.398	
121	3.578.399	
152	3.578.400	
154	3.578.401	
165	3.578.402	
191	3.578.403	
230	3.578.404	
	3.578.405	
232	3.578.406	
	3.578.410	
252	3.578.407	
253	3.578.408	
254	3.578.409	
258.5	3.578.411	
259	3.578.412	
260	3.578.413	
273	3.578.414	
277	3.578.416	
281	3.578.415	
294	3.578.417	
299	3.578.418	
317	3.578.419	
24– 95	3.577.846	
29–195	3.578.420	
203	3.577.847	
427	3.577.848	
495	3.577.849	
510	3.577.850	
596	3.577.851	
30– 43.92	3.577.852	
32– 10	3.577.853	
33– 1	3.577.854	
174	3.577.855	
184.5	3.577.856	
35– 11	3.577.857	
36– 2.5	3.577.858	
38– 71	3.577.859	
42– 50	3.577.860	
44– 62	3.578.421	
63	3.578.422	
48–197	3.578.423	
51– 73	3.577.861	
89	3.578.424	
295	3.578.425	
52–220	3.577.863	
223	3.577.862	
473	3.577.864	
53– 25	3.577.865	
184	3.577.866	
55– 62	3.577.867	
178	3.577.868	
361	3.577.869	
56– 6	3.577.870	
255	3.577.871	
57– 35	3.577.872	
144	3.577.873	
58– 23	3.577.874	
28	3.577.875	
57.5	3.577.876	
60– 39.28	3.577.877	
.65	3.577.878	
61– 1	3.577.879	
62– 86	3.577.880	
65– 3	3.578.426	
58	3.578.427	
60	3.578.428	
154	3.578.429	
157	3.578.430	
70–364	3.578.371	
71– 1	3.578.431	
	3.578.432	
	3.578.433	
77	3.578.434	
92	3.578.435	
72–302	3.577.881	
450	3.577.882	
73– 88.5	3.577.883	
141	3.577.884	
150	3.577.885	
425.4	3.577.886	
74– 2	3.577.887	
711	3.577.888	
75– .5	3.578.436	
5	3.578.437	
73	3.578.438	
129	3.578.439	
170	3.578.440	
171	3.578.441	
206	3.578.442	
	3.578.443	
83– 7	3.577.889	
84–472	3.577.890	
92– 72	3.577.891	
93– 93	3.577.892	
94– 4	3.577.893	
7	3.577.894	
	3.577.895	
24	3.577.896	
48	3.577.897	
95– 11	3.577.898	
	3.577.899	
31	3.577.900	
57	3.577.901	
96– 1	3.578.444	
.5	3.578.445	
.8	3.578.446	
3	3.578.447	
	3.578.448	
29	3.578.449	
	3.578.450	
33	3.578.451	
49	3.578.452	
60	3.578.453	
	3.578.454	
90	3.578.455	
	3.578.456	
91	3.578.457	
115	3.578.458	
98– 1.5	3.577.902	
2	3.577.903	
40	3.577.904	
94	3.577.905	
99– 1	3.578.459	
7	3.578.460	
	3.578.461	
90	3.578.462	
103	3.578.463	
	3.578.464	
140	3.578.465	
156	3.578.466	
182	3.578.467	
234	3.577.906	
329	3.577.907	
333	3.577.908	
100– 4	3.577.909	
17	3.577.910	
53	3.577.911	
218	3.577.912	
101– 93	3.577.913	
124	3.577.914	
129	3.577.915	
148	3.577.916	
269	3.577.917	
328	3.577.918	
426	3.577.919	
459	3.577.920	
102– 38	3.577.921	
42	3.577.924	
44	3.577.922	
46	3.577.923	
70.2	3.577.925	
76	3.577.926	
104– 23	3.577.927	
148	3.577.928	
	3.577.929	
173	3.577.930	
105–197	3.577.931	
253	3.577.932	
105–366	3.577.933	
414	3.577.934	
106– 1	3.578.468	
	3.578.469	
39	3.578.470	
	3.578.471	
56	3.578.472	
58	3.578.473	
59	3.578.474	
150	3.578.475	
193	3.578.476	
230	3.578.477	
286	3.578.478	
107– 14	3.577.935	
108– 8	3.577.936	
53	3.577.937	
110– 8	3.577.938	
	3.577.939	
	3.577.940	
14	3.577.941	
112– 25	3.577.942	
79	3.577.943	
127	3.577.944	
153	3.577.945	
114– .5	3.577.946	
61	3.577.947	
66.5	3.577.948	
206	3.577.949	
	3.577.950	
210	3.577.951	
115– 17	3.577.952	
41	3.577.953	
	3.577.954	
116–114	3.577.955	
117– 2	3.578.479	
4	3.578.480	
8	3.578.481	
38	3.578.482	
	3.578.483	
47	3.578.484	
62	3.578.485	
93.41	3.578.486	
121	3.578.487	
123	3.578.488	
128.4	3.578.489	
138.8	3.578.490	
	3.578.491	
139.5	3.578.492	
155	3.578.493	
160	3.578.494	
201	3.578.495	
227	3.578.496	
119– 15	3.577.956	
51.11	3.577.957	
122– 7	3.577.958	
31	3.577.959	
123– 8.09	3.577.960	
52	3.577.961	
103	3.577.962	
117	3.577.963	
119	3.577.964	
	3.577.965	
124	3.577.966	
140	3.577.967	
	3.577.968	
	3.577.969	
	3.577.978	
146.5	3.577.970	
148	3.577.971	
188	3.577.972	
126–200	3.577.973	
208	3.577.974	
343.5	3.577.975	
	3.577.976	
127– 32	3.578.497	
71	3.578.498	
128– 1	3.577.977	
2	3.577.979	
	3.577.980	
	3.577.981	
	3.577.982	
.06	3.577.983	
.08	3.577.984	
57	3.577.985	
96	3.577.986	
130	3.577.987	
142.7	3.577.988	
283	3.577.989	
295	3.577.990	
340	3.577.991	
128–349	3.577.992	
535	3.577.993	
131– 2	3.577.994	
10.5	3.577.995	
	3.577.996	
17	3.577.997	
96	3.577.998	
	3.577.999	
132– 79	3.578.000	
134– 4	3.578.499	
25	3.578.002	
45	3.578.001	
135– 4	3.578.003	
136– 6	3.578.500	
86	3.578.501	
102	3.578.503	
	3.578.504	
120	3.578.502	
	3.578.505	
168	3.578.506	
137– 1	3.578.004	
3	3.578.005	
38	3.578.006	
51	3.578.007	
68	3.578.008	
81.5	3.578.009	
	3.578.010	
	3.578.011	
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	3.578.013	
113	3.578.015	
115	3.578.014	
216	3.578.016	
344	3.578.017	
489	3.578.018	
491	3.578.019	
512	3.578.020	
515	3.578.021	
592	3.578.023	
596	3.578.022	
625.66	3.578.025	
627.5	3.578.024	
138– 89	3.578.027	
110	3.578.026	
123	3.578.028	
133	3.578.029	
141	3.578.030	
139–122	3.578.031	
126	3.578.032	
140– 1	3.578.034	
102.5	3.578.035	
107	3.578.036	
141– 2	3.578.037	
7	3.578.038	
18	3.578.039	
59	3.578.041	
142	3.578.040	
301	3.578.042	
143– 6	3.578.043	
12	3.578.044	
32	3.578.033	
144–288	3.578.045	
145– 50	3.578.046	
146– 16	3.578.047	
78	3.578.048	
98	3.578.049	
148– 1.5	3.578.507	
6.14	3.578.508	
.16	3.578.509	
	3.578.510	
11.5	3.578.511	
147	3.578.512	
171	3.578.513	
175	3.578.514	
	3.578.515	
149– 22	3.578.516	
150– .5	3.578.050	
52	3.578.051	
152–187	3.578.052	
210	3.578.053	
330	3.578.054	
	3.578.055	
340	3.578.056	
356	3.578.057	
156– 40	3.578.517	
64	3.578.518	
69	3.578.519	
79	3.578.520	
84	3.578.521	
94	3.578.522	
156–164	3.578.523	
196	3.578.524	
238	3.578.525	
242	3.578.526	
244	3.578.527	
380	3.578.528	
393	3.578.529	
410	3.578.530	
425	3.578.531	
431	3.578.532	
436	3.578.533	
461	3.578.534	
493	3.578.535	
497	3.578.536	
537	3.578.537	
157– 1.17	3.578.058	
.21	3.578.059	
160–172	3.578.060	
202	3.578.061	
161– 6	3.578.538	
	3.578.539	
	3.578.540	
7	3.578.541	
21	3.578.542	
38	3.578.543	
59	3.578.544	
86	3.578.545	
89	3.578.546	
156	3.578.547	
160	3.578.548	
	3.578.549	
162	3.578.550	
173	3.578.551	
214	3.578.552	
162– 14	3.578.553	
19	3.578.554	
164	3.578.555	
203	3.578.556	
301	3.578.557	
303	3.578.558	
	3.578.559	
344	3.578.560	
352	3.578.561	
164– 82	3.578.062	
281	3.578.063	
	3.578.064	
	3.578.065	
165– 27	3.578.066	
39	3.578.067	
	3.578.068	
61	3.578.069	
	3.578.070	
63	3.578.076	
66	3.578.071	
84	3.578.072	
111	3.578.073	
132	3.578.074	
177	3.578.075	
166– 68	3.578.077	
152	3.578.078	
187	3.578.079	
248	3.578.080	
249	3.578.081	
252	3.578.082	
285	3.578.083	
288	3.578.084	
307	3.578.085	
168– 18	3.578.086	
24	3.578.087	
171– 62	3.578.088	
172–277	3.578.089	
439	3.578.090	
173– 12	3.578.091	
175– 39	3.578.092	
60	3.578.093	
176– 22	3.578.562	
51	3.578.563	
87	3.578.564	
177–108	3.578.094	
180– 5	3.578.095	
14	3.578.096	
79.1	3.578.097	
89	3.578.098	
106	3.578.108	
119	3.578.099	
126	3.578.100	
181– .5	3.578.101	
	3.578.102	
31	3.578.103	
32	3.578.104	
181– 33	3.578.105	
	3.578.106	
57	3.578.107	
182–129	3.578.109	
	3.578.110	
184– 6	3.578.111	
	3.578.112	
106	3.578.113	
188–311	3.578.114	
9: 48	3.578.115	
192– .062	3.578.116	
3.51	3.578.117	
16	3.578.118	
70.14	3.578.119	
103	3.578.120	
106.2	3.578.121	
107	3.578.122	
131	3.578.123	
194– 4	3.578.124	
13	3.578.125	
16	3.578.126	
71	3.578.127	
195– 51	3.578.565	
82	3.578.566	
197– 17	3.578.128	
19	3.578.129	
64	3.578.130	
82	3.578.131	
91	3.578.132	
98	3.578.133	
114	3.578.134	
133	3.578.135	
	3.578.138	
151	3.578.136	
170	3.578.137	
198– 28	3.578.139	
33	3.578.140	
	3.578.141	
	3.578.142	
40	3.578.143	
41	3.578.144	
115	3.578.145	
121	3.578.146	
171	3.578.147	
181	3.578.148	
201	3.578.149	
213	3.578.150	
230	3.578.151	
203– 49	3.578.567	
64	3.578.568	
204– 1	3.578.569	
33	3.578.570	
43	3.578.571	
95	3.578.572	
140.5	3.578.573	
143	3.578.574	
162	3.578.575	
	3.578.576	
181	3.578.577	
195	3.578.578	
	3.578.579	
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206– 3	3.578.152	
17	3.578.153	
45.14	3.578.154	
52	3.578.156	
56	3.578.157	
58	3.578.155	
65	3.578.158	
208–138	3.578.582	
	3.578.583	
139	3.578.584	
308	3.578.581	
209– 74	3.578.159	
81	3.578.160	
86	3.578.161	
172	3.578.162	
210– 30	3.578.585	
49	3.578.586	
52	3.578.587	
	3.578.588	
58	3.578.589	
75	3.578.163	
96	3.578.164	
110	3.578.166	
134	3.578.167	
167	3.578.168	
169	3.578.169	
230	3.578.170	
242	3.578.171	

210–321	3,578,172
	3,578,173
416	3,578,174
489	3,578,175
492	3,578,176
211– 49	3,578,177
50	3,578,178
212– 61	3,578,179
213– 20	3,578,180
214– 6	3,578,181
	3,578,182
17	3,578,183
38	3,578,184
	3,578,185
83.22:	3,578,186
89	3,578,187
138	3,578,188
152	3,578,189
505	3,578,190
771	3,578,191
215– 9	3,578,192
	3,578,193
13	3,578,194
47	3,578,195
88	3,578,196
219–107	3,578,165
220– 16	3,578,197
25	3,578,198
31	3,578,199
42	3,578,200
44	3,578,201
46	3,578,202
	3,578,203
72	3,578,204
85	3,578,205
221–124	3,578,206
232	3,578,207
222– 23	3,578,209
52	3,578,210
56	3,578,211
71	3,578,212
95	3,578,213
129.1	3,578,214
193	3,578,215
195	3,578,216
218	3,578,217
383	3,578,218
394	3,578,219
402.13:	3,578,220
.22:	3,578,221
504	3,578,222
521	3,578,223
546	3,578,224
224– 4	3,578,208
5	3,578,225
45	3,578,226
225– 2	3,578,227
226–109	3,578,228
114	3,578,229
162	3,578,230

227–123	3,578,231
228– 2	3,578,232
5	3,578,233
229– 14	3,578,234
15	3,578,235
	3,578,237
40	3,578,238
53	3,578,239
55	3,578,236
233– 26	3,578,240
235– 88	3,578,241
236– 1	3,578,242
80	3,578,243
239– 1	3,578,244
8	3,578,246
29	3,578,247
66	3,578,245
242	3,578,248
296	3,578,249
241– 46.02:	3,578,250
74	3,578,251
141	3,578,252
168	3,578,253
275	3,578,254
242– 18	3,578,255
36	3,578,256
68.3	3,578,257
74.1	3,578,258
107.2	3,578,259
.4	3,578,260
199	3,578,261
	3,578,262
244– 7	3,578,263
41	3,578,264
42	3,578,265
43	3,578,266
77	3,578,267
	3,578,268
	3,578,269
83	3,578,270
110	3,578,271
	3,578,272
115	3,578,273
118	3,578,274
152	3,578,275
248– 4	3,578,277
20	3,578,278
	3,578,279
54	3,578,280
214	3,578,282
346	3,578,281
249–165	3,578,276
251– 31	3,578,283
88	3,578,284
218	3,578,285
303	3,578,286
306	3,578,287
	3,578,288
309	3,578,289
252– 8.05:	3,578,590

252– 8.7	3,578,591
.8	3,578,592
.9	3,578,594
49.6	3,578,596
62.1	3,578,593
66	3,578,597
75	3,578,595
102	3,578,598
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135	3,578,601
300	3,578,602
301.4	3,578,603
316	3,578,604
	3,578,605
386	3,578,606
389	3,578,607
411	3,578,608
430	3,578,609
254–139.1	3,578,290
259– 75	3,578,291
177	3,578,292
260– 2	3,578,611
.5	3,578,612
3	3,578,613
13	3,578,614
17	3,578,618
18	3,578,615
	3,578,616
	3,578,640
21	3,578,617
22	3,578,619
	3,578,635
23.7	3,578,620
31.6	3,578,621
33.8	3,578,622
40	3,578,623
41	3,578,629
	3,578,630
.5	3,578,624
45.75:	3,578,625
47	3,578,631
	3,578,632
	3,578,633
	3,578,634
63	3,578,636
	3,578,637
77.5	3,578,638
	3,578,639
78	3,578,641
.3	3,578,642
.4	3,578,643
	3,578,644
.5	3,578,645
85.7	3,578,646
86.7	3,578,647
87.5	3,578,648
92.8	3,578,649
93.7	3,578,650
94.1	3,578,626

260– 94.4	3,578,627
97.7	3,578,628
124	3,578,651
151	3,578,652
157	3,578,653
186	3,578,654
209	3,578,655
	3,578,656
234	3,578,657
239	3,578,658
.55:	3,578,659
243	3,578,660
	3,578,661
248	3,578,662
	3,578,663
249.7	3,578,664
250	3,578,665
256.5	3,578,666
286	3,578,667
288	3,578,668
294	3,578,669
	3,578,670
307	3,578,671
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	3,578,673
308	3,578,674
309.2	3,578,675
	3,578,676
.7	3,578,677
315	3,578,678
326.11:	3,578,680
.5	3,578,679
327	3,578,681
	3,578,682
335	3,578,683
340.2	3,578,684
396	3,578,685
	3,578,686
404	3,578,687
405.6	3,578,688
410.9	3,578,689
414	3,578,690
448.2	3,578,691
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	3,578,693
456	3,578,694
465.3	3,578,695
	3,578,696
.4	3,578,697
475	3,578,698
476	3,578,699
484	3,578,700
485	3,578,701
486	3,578,702
488	3,578,703
507	3,578,704
521	3,578,705
524	3,578,706
530	3,578,707
534	3,578,708

260–534	3,578,709
543	3,578,710
558	3,578,711
559	3,578,712
580	3,578,713
581	3,578,714
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607	3,578,717
609	3,578,718
611	3,578,719
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648	3,578,721
650	3,578,716
671	3,578,722
672	3,578,723
678	3,578,724
683.75:	3,578,725
825	3,578,726
830	3,578,727
859	3,578,728
873	3,578,729
	3,578,730
929	3,578,731
261– 64	3,578,293
90	3,578,294
122	3,578,295
263– 21	3,578,296
32	3,578,297
	3,578,298
	3,578,299
41	3,578,300
47	3,578,301
264– .5	3,578,610
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PATENT OFFICE NOTICES

Appeal Briefs Under Rules 192 and 193(b)

Appellants are reminded that their briefs in appealed cases must be responsive to every ground of rejection stated by the examiner, including new grounds stated in his answer.

Where an appellant fails to respond by way of brief or reply brief to any ground of rejection, and it appears that the failure is inadvertent, appellant shall be notified that he is allowed one month to correct the defect by filing a supplemental brief. Where this procedure has not been followed, the Board of Appeals should remand the application to the examiner for compliance. When the record clearly indicates intentional failure to respond by brief to any ground of rejection, for example, by failure to file a supplemental brief within the one-month period allowed for that purpose, the examiner should inform the Board of Appeals of this fact in his answer and merely specify the claims affected.

Where the failure to respond by brief appears to be intentional, the Board of Appeals may dismiss the appeal as to the claims involved. Oral argument at a hearing will not remedy such deficiency of a brief.

This notice supersedes the notices of May 4, 1966, 826 O.G. 1060, and of Oct. 20, 1966, 833 O.G. 1.

WILLIAM E. SCHUYLER, Jr.,
Commissioner of Patents.

Apr. 26, 1971.

TITLE 37—PATENTS, TRADEMARKS, AND COPYRIGHTS

Chapter I—Patent Office, Department of Commerce

PART 1—RULES OF PRACTICE IN PATENT CASES

PART 3—FORMS FOR PATENT CASES

Conflicting Claims

These rule changes are intended to provide: (1) a basis for requiring a determination of priority without an interference by the common owner of a plurality of applications, or patent and applications, containing conflicting claims, and (2) a basis for requiring inclusion of a common ownership clause in all terminal disclaimers filed to obviate a double patenting rejection.

The proposal to amend Title 37, Code of Federal Regulations, by revising §§ 1.78 and 1.321 and by adding a new § 3.53 was published in the December 31, 1970, issue of the Federal Register (35 F.R. 20011).

All interested persons were given an opportunity to participate in the rule making process by submission of comments in writing and in person at an oral hearing held on February 19, 1971. Changes have been made in the text of the original proposal as a result of these comments.

In consideration of the comments received and pursuant to the authority contained in section 6 of the Act of July 19, 1952 (66 Stat. 793; 35 U.S.C. 6), Parts 1 and 3 of Title 37, Code of Federal Regulations, are hereby amended as follows:

1. In § 1.78, paragraph (b) has been revised and paragraph (c) has been added to read as follows:

§ 1.78 *Cross-references to other applications.*

* * * * *

(b) Where two or more applications filed by the same applicant contain conflicting claims, elimination of such claims from all but one application may be required in the absence of good and sufficient reason for their retention during pendency in more than one application.

(c) Where two or more applications, or an application and a patent naming different inventors and owned by the same party contain conflicting claims, the assignee may be called upon to state which named inventor is the prior inventor. In addition to making said statement, the assignee may also explain why an interference should be declared or that no conflict exists in fact.

2. Section 1.321 is revised to read as follows:

§ 1.321 *Statutory disclaimer.*

(a) A disclaimer under 35 U.S.C. 253 must identify the patent and the claim or claims which are disclaimed, and be signed by the person making the disclaimer, who shall state therein the extent of his interest in the patent. A disclaimer which is not a disclaimer of a complete claim or claims may be refused recordation. A notice of the disclaimer is published in the OFFICIAL GAZETTE and attached to the printed copies of the specification. In like manner any patentee or applicant may disclaim or dedicate to the public the entire term, or any terminal part of the term, of the patent granted or to be granted.

(b) A terminal disclaimer, when filed in an application to obviate a double patenting rejection, must include a provision that any patent granted on that application shall be enforceable only for and during such period that said patent is commonly owned with the application or patent which formed the basis for the rejection. See § 1.21 for fee.

3. A new § 3.53 is added, which reads as follows:

§ 3.53 *Terminal disclaimers in applications.*

To the Commissioner of Patents:

Your petitioner, _____, residing at _____ in the county of _____ and State of _____ represents that he is (here state exact interest of the disclaimant and, if he is an assignee, set out the liber and page or reel and frame where the assignment is recorded) of application Serial No. _____, filed on the _____ day of _____, 19___ for _____. Your petitioner, _____, hereby disclaims the terminal part of any patent granted on the above-identified application, which would extend beyond the expiration date of Patent No. _____ and hereby agrees that any patent so granted on the above-identified application shall be enforceable only for and during such period that the legal title to said patent shall be the same as the legal title to United States Patent No. _____, this agreement to run with any patent granted on the above identified aplication and to be binding upon the grantee, its successors or assigns.

Effective date. This revision shall become effective on April 30, 1971.

WILLIAM E. SCHUYLER, Jr.,
Commissioner of Patents.

Approved: April 12, 1971.
JAMES H. WAKELIN, Jr.,
Assistant Secretary for Science and Technology.

[FR Doc. 71-5418; Filed 4-16-71; 8:51 am]

Published in 36 F.R. 7312; Apr. 17, 1971

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,809,092, Zimmerley and Malouf, EXTRACTION OF RHENIUM INCIDENTAL TO MANUFACTURE OF MOLYBDENUM OXIDE, **filed** Dec. 8, 1970, D.C. Colo. (Denver), Doc. C-2763, *Kennecott Copper Corporation v. The S. W. Shattuck Chemical Co., Inc. and Engelhard Minerals and Chemical Corporation.*

2,828,449, I. L. Kerper, SAFETY FEATURE FOR ELECTRIC WATERTIGHT DOOR SYSTEMS, **filed** Dec. 11, 1970, D.C., C.D. Calif. (Los Angeles), Doc. 70-2777-F, *Irving L. Kerper v. Grace Line, Continental Equipment Corp. et al.*

2,895,003, G. M. Rapata, STRAIN RELIEF GROMMET; **2,930,840**, F. Klumpp, Jr., STRAIN RELIEF BUSHING, **filed** May 12, 1967, D.C., N.D. Ill. (Chicago), Doc. 67c801, *Heyman Manufacturing Company v. Richlock Corporation et al.* Order on stipulation, dismissed and judgment by consent, Dec. 4, 1970.

2,907,585, Sornberger and Wakeman, MANIFOLDING ASSEMBLIES, **filed** Aug. 6, 1968, D.C., S.D. Fla. (Miami), Doc. 68-934-TC, *Moore Business Forms, Inc. v. Gulfstream Press, Inc.* Judgment by consent, patent valid and infringed by defendant. Defendant's counterclaim dismissed with prejudice, Nov. 18, 1970.

2,930,840. (See 2,895,003.)

3,045,910, H. M. McLearn, AUTOMATIC COUNTING MACHINE, **filed** Dec. 3, 1970, D.C., N.D. Fla. (Jacksonville), Doc. 70-249-Orl-C, *American Machinery Corporation v. FMC Corporation.*

3,096,048, P. E. Yost, HEATED GAS GENERATOR FOR BALLOON; **3,131,889**, same, BALLOON STRUCTURE WITH RELEASE MECHANISM; **3,229,932**, same, MANEUVERING VALVE FOR HOT AIR BALLOON, **filed** Dec. 17, 1970, D.C., C.D. Calif. (Los Angeles), Doc. 70-2841-DWW, *Raven Industries, Inc. v. Donald L. Piccard.*

3,111,691, Luger and Luger, SECTIONAL BOAT STRUCTURE, **filed** Nov. 18, 1970, D.C. Minn. (Minneapolis), Doc. 4-70-C-497, *Luger Industries, Inc. v. Commodore Kits and Donald Simerson.*

3,131,889. (See 3,096,048.)

3,146,319, W. O. Stanton, MAGNETIC PHONOGRAPH PICKUP WITH COMPENSATING POLE PIECE ARRANGEMENT; **3,297,831**, same, MAGNETIC STEREOPHONIC PHONOGRAPH PICKUP, **filed** Oct. 8, 1970, D.C., S.D.N.Y., Doc. 70-C-4372, *Pickering & Company Inc. v. Qualitone Industries, Inc.* Consent order, defendant perpetually enjoined, Dec. 7, 1970.

3,150,216, W. Z. Salcer, METHOD FOR MAKING PLASTIC ARTICLES; **3,248,757**, same, APPARATUS FOR MAKING PLASTIC ARTICLES, **filed** Dec. 8, 1970, D.C. Conn. (Bridgeport), Doc. B-226-C, *American Universal, Inc. v. Susemihl Magnesium Etching Co., Inc. and Swan Engineering Co., Inc.*

3,157,157, Clay and Letson, METHOD AND APPARATUS FOR DISPENSING FEED TO LIVESTOCK, **filed** Mar. 23, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c687, *Clay Equipment Corporation v. The De Laval Separator Company.* Consent judgment, case dismissed, Dec. 15, 1970.

3,161,908, P. Walach, HYDRAULIC DOOR CLOSER, **filed** Nov. 10, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c2804, *Monteray Manufacturing Co. v. Hartzell Manufacturing, Inc. et al.*

3,229,932. (See 3,096,048.)

3,248,757. (See 3,150,216.)

3,296,052, A. M. Bechtold, MEANS AND METHOD FOR POSTFORMING PLASTIC LAMINATED PRODUCTS, **filed** Dec. 16, 1970, D.C., M.D. Fla. (Tampa), Doc. 70-572-C, *Roberts Consolidated Industries Inc. v. Stewart Loehr, doing business as Stewart Loehr Laminate Tool Mfg.*

3,297,831. (See 3,146,319.)

3,325,018, L. A. Wright, ARTICULATING CRANE, **filed** Dec. 7, 1970, D.C., W.D. Wash. (Seattle), Doc. 9371, *Star Iron & Steel Co. and International Terminal v. Freuhauf Corporation.*

3,343,375, L. K. Quick, LATENT HEAT REFRIGERATION DEFROSTING SYSTEM, **filed** Oct. 28, 1970, D.C. Del. (Wilmington), Doc. 4002, *Hussman Refrigerator Co., and Pet Incorporated v. Hillman Coal & Coke Company, and Melchior, Armstrong, Dessau, Inc.*

3,359,116, L. L. Little, PROCESS OF MAKING SOUR CREAM TYPE PRODUCTS AND CREAM CHEESE; **3,378,375**, same, METHOD OF PREPARING ACIDIFIED DAIRY PRODUCTS, **filed** Dec. 3, 1970, D.C., S.D. Ohio (Cincinnati), Doc. 7771, *The Battelle Development Corp. v. Diamond-Shamrock Corp.*

3,378,375. (See 3,359,116.)

3,409,000, Brader and Tanasse, SYSTEM FOR HEATING LARGE VOLUMES OF AIR, **filed** Dec. 2, 1970, D.C., E.D. Wash. (Yakima), Doc. 2676-C, *Redi-Fire Heating, Inc. v. Orchard Rite, Inc.*

3,439,452, O. Kain, MIRRORED DOOR APPARATUS, **filed** Dec. 11, 1970, D.C., C.D. Calif. (Los Angeles), Doc. 70-2781-EC, *Oscar Kain v. Manufacturers Mirror Door Co., Inc.*

3,444,621, E. C. Pletcher, ORTHODONTIC APPLIANCE, **filed** May 15, 1970, D.C.N.J. (Newark), Doc. 616-70, *G.A.C. International, Inc. v. Unitek Corporation.* Consent judgment dismissing complaint, Dec. 10, 1970.

3,458,102, Zanger and Szasz, SEMICONDUCTOR WAFER PICKUP AND BONDING TOOL, **filed** Nov. 30, 1970, D.C., C.D. Calif. (Los Angeles), Doc. 70-2681-CC, *Kulicke & Soffa Industries, Inc. v. Gaiser Tool Company.*

3,491,446, Griffiths and Martin, EXTENSION DEVICE, **filed** May 13, 1970, D.C., N.D. Calif. (San Francisco), Doc. C70-1011-AJZ, *Keith K. Griffiths and James D. Martin v. Kalabar, Inc.* Consent judgment, plaintiff owner of patent and defendant has infringed, June 17, 1970.

3,494,253, Hood and Truitt, METALLIC STRIP MILLING MACHINE, **filed** Dec. 15, 1970, D.C., E.D.N.Y. (Brooklyn), Doc. 70-C-1517, *Metals Engineering Company v. North American Specialties Corporation.*

Patents Available for Licensing or Sale

D. 217,444. WHEELED CARRIER. Leo Stein, Box 1063, F.D.R. station, New York, N.Y., 10022.

3,191,513. FOLDING BELLOWS WITH INTERLOCKING CORNERS FOR PHOTOGRAPHIC DEVICES. Correspondence to: Central Trust Company Rochester N.Y., 44 Exchange St., Rochester, N.Y., 14614. Attn: William K. Sjea, Asst. Vice Pres.

3,225,761. FATIGUE SUPPORT. Robert Swensen, 120 Poincianna Drive, Martinez, Ga., 30907.

3,420,503. DEVICE FOR MAKING A CONTROLLED DESCENT. T/Sgt. Otto Stangl, Lot 23, Trailer Park, Langley A.F.B., Va., 23365.

3,535,667. ELECTRICAL SAFETY DEVICE. Henry C. Harnish, Jr., and Anthony J. Osello, Elcock Ave., Boonton, N.J., 07005.

3,559,328. LINE-CASTER ATTACHMENT FOR FISHING ROD. Royal B. Lesher, 3200 W. 29th Turnagain S., Anchorage, Alaska, 99503.

3,559,988. SPRING TYPE ARM EXERCISING DEVICE. Russell C. Greenlees, 316 E. Shadbolt St., Lake Orion, Mich., 48035.

3,568,355. SLIDING FISHING SINKER. Jack V. Hassell, 902 Del Paso Blvd., Space #3, Sacramento, Calif., 95815.

3,570,176. TOY MACHINE GUN. Henry J. Palmer, 699 N. Broad St., Philadelphia, Pa., 19123.

3,570,793. FISH POLE HOLDER FOR CASTING-SPINNING-DEEP SEA FISHING ROD. Joseph T. Shackel, 14636 Bringard, Detroit, Mich., 48205.

3,577,386. PROTECTIVE HEADGEAR. Norma E. Fisher, Rte. #1, Cedar, Minn., 55011.

The following 2 patents are offered by: Russell W. Weidenbacker, Box 153, Haverford, Pa., 19041.

3,558,149. ELASTOMERIC-BONDED ICE SKATE.

3,545,778. SAFETY AND DECORATIVE COVER FOR ICE SKATES.

The following 2 patents are offered by: Zed Cunningham, 4101 Green Court, Cleveland, Ohio, 44104.

3,038,528. TIRE MOUNTING APPARATUS.

3,347,998. TELEPHONE HANDSET HOLDER.

The following 3 patents are offered by: John W. Barnd, 32 Hollybrook Road, Paramus, N.J.

3,351,128. MULTI-ZONE TEMPERATURE CONTROL.

3,496,991. FLUID TEMPERATURE REGULATING METHOD AND APPARATUS.

3,515,345. MULTI-ZONE TEMPERATURE CONTROL.

General Electric Company is prepared to grant non-exclusive licenses under the following 19 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following 2 patents may be addressed to: Patent Counsel, Mobile Radio Department, General Electric Co., Lynchburg, Va., 24502.

3,054,966. CRYSTAL CONTROLLED OSCILLATOR WITH TEMPERATURE COMPENSATING MEANS.

3,543,053. ELECTRONIC SINGLE-POLE, DOUBLE-THROW SWITCH.

Applications for license under the following 3 patents may be addressed to: Department Patent Counsel, Apollo & Ground Systems, General Electric Co., P.O. Box 2500, Daytona Beach, Fla., 32015.

3,550,114. PREWIRED ADDRESS SEQUENCER FOR SUCCESSIVE APPROXIMATION ANALOG TO DIGITAL CONVERTER.

3,555,298. ANALOG TO PULSE DURATION CONVERTER.

3,564,538. MULTIPLE SLOPE ANALOG TO DIGITAL CONVERTER.

Applications for license under the following 14 patents may be addressed to: Patent Counsel, Audio Electronics Business Department, Bldg. 1, Electronics Park, General Electric Company, Syracuse, N.Y., 13201.

3,561,766. SWITCH ACTUATING MECHANISM FOR RECORD PLAYER.

3,560,001. TURNTABLE AND TONE ARM MECHANISM FOR RECORD PLAYER.

3,492,004. GUIDING STRUCTURE FOR PHONOGRAPH TONE ARMS.

3,495,836. PORTABLE RECORDING APPARATUS.

3,495,839. TURNTABLE RECESS FOR RECORD REMOVAL.

3,501,214. LID LATCH FOR PHONOGRAPH.

3,500,219. AUDIO AMPLIFIER.

3,521,889. RECORDING APPARATUS.

3,527,530. SLIDE VIEWER.

3,531,130. PIVOTAL SUPPORT ASSEMBLY FOR PHONOGRAPH RECORD AND PLAYBACK ARMS.

3,417,322. SIMPLIFIED PIEZORESISTIVE FORCE SENSING DEVICE.

D. 218,911. PORTABLE PHONOGRAPH OR SIMILAR ARTICLE.

3,498,659. MULTISECTION CASING AND LATCH MECHANISM THEREFOR.

3,534,180. PHONOGRAPH PREAMPLIFIER WITH DIRECT DC BIAS COUPLING BETWEEN THE TRANSISTOR AND PIEZORESISTIVE PICKUP.

Registration to Practice

The following list contains the names of applicants for registration to practice before the United States Patent Office who attained passing grades in the examinations of March 31, and September 15, 1970, respectively. Information tending to affect the eligibility of any of said applicants on moral or ethical grounds should be furnished the Commissioner of Patents on or before June 14, 1971.

ROBERT GOTTSCHALK,
Apr. 22, 1971. *Chairman, Committee on Enrollment.*

LIST OF APPLICANTS

Baehr, Fred J., Jr., 212 Monticello Drive, Export, Pa. 15632
Blodgett, Gerry A., 39 Highland St., Worcester, Mass. 01608
Eipper, Eugene B., 233 Grandview Ave., Pitman, N.J. 08071
Fleming, Frederick A., 1860 Highland Parkway, St. Paul, Minn. 55116
Hagopian, Robert W., 109 Hemenway Ct., Boston, Mass. 02115
Kelleher, John J., 111 S. 4th St., Bethpage, N.Y. 11714
Krawitz, Willie, 3001 Chapel Hill Rd., Orange, Calif. 92667
Lloyd, Lewis L., 80 Main St., Landisville, Pa. 17538
O'Reilly, David, 327 Riley St., Falls Church, Va. 22046
Penland, Raphael B., 1305 Parkington Lane, Bowie, Md. 20715
Skinkiss, Ralph J., 1255 Flicker Drive, Florissant, Mo. 63031
Spicer, James M., 273 East Drive, Oak Ridge, Tenn. 37830
Stott, Ronald A., 206 Helen St., North Syracuse, N.Y. 13212
Thomas, Gilbert A., 14711 Mimosa Lane, Tustin, Calif. 92680
Walpert, Gary A., 1321 Worcester Road, Framingham, Mass. 01701
Wildensteiner, Otto, 2207 Seminary Road, Silver Spring, Md. 20910

Certificates of Correction for the Week of May 18, 1971

Re. 26,963	3,544,327	3,556,147	3,560,396
3,240,799	3,544,610	3,556,220	3,560,535
3,372,414	3,544,695	3,556,314	3,560,572
3,375,414	3,546,194	3,556,512	3,560,576
3,440,051	3,546,199	3,556,904	3,560,639
3,485,797	3,546,980	3,556,923	3,560,751
3,496,244	3,547,684	3,557,109	3,560,793
3,499,008	3,549,592	3,557,117	3,561,108
3,503,758	3,549,608	3,557,207	3,561,369
3,509,211	3,550,434	3,557,460	3,561,665
3,517,558	3,551,429	3,557,473	3,461,773
3,521,672	3,551,525	3,557,648	3,562,160
3,523,768	3,551,593	3,557,881	3,562,282
3,534,404	3,551,688	3,557,916	3,562,338
3,535,134	3,552,409	3,558,335	3,562,348
3,536,137	3,552,764	3,558,418	3,562,580
3,536,749	3,553,428	3,558,585	3,562,785
3,537,852	3,553,614	3,558,624	3,563,448
3,538,184	3,554,046	3,558,692	3,563,604
3,539,366	3,554,404	3,558,747	3,563,738
3,539,461	3,554,430	3,558,811	3,563,966
3,542,818	3,554,502	3,558,985	3,565,165
3,542,926	3,554,624	3,559,094	3,565,671
3,543,704	3,555,097	3,559,546	
3,543,735	3,556,081	3,560,177	

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 4, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds: Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-02-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-02-69
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-10-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-03-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-17-69
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	8-17-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-11-69
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-13-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-03-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	1-21-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	6-03-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	3-09-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	1-02-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-02-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	6-08-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	1-06-70

Expiration of patents: The patents within the range of numbers indicated below expire during May 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

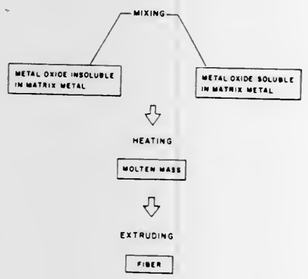
Patents ..... Numbers 2,677,129 to 2,679,644, inclusive
Plant Patents ..... Numbers 1,274 to 1,281, inclusive

REISSUES

MAY 18, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

27,123
EXTRUDING FIBERS HAVING OXIDE SKINS
Norman E. Alber, Mentor, Ohio, and Walter E. Smith, Hingham, Mass., assignors to Clevite Corporation
Original No. 3,216,076, dated Nov. 9, 1965, Ser. No. 191,340, Apr. 30, 1962. Application for reissue May 26, 1969, Ser. No. 835,867
Int. Cl. B22d *11/00*
U.S. Cl. 164—86 **8 Claims**



Metallic fibers and filaments made by extrusion of certain molten alloys into air, said alloys containing a major portion of a metal the oxide of which is soluble in the melt and a minor portion of a metal the oxide of which is insoluble in the melt. The oxide skin formed by extrusion into air stabilizes the molten jet pending solidification.

27,124
WOOD DRYING METHOD
Robert W. Erickson, St. Paul, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.
No Drawing. Original No. 3,309,778, dated Mar. 21, 1967, Ser. No. 523,869, Feb. 1, 1966. Application for reissue Dec. 29, 1969, Ser. No. 888,180
Int. Cl. F26b *5/06*
U.S. Cl. 34—5 **4 Claims**

A method of accelerating the drying rate of lumber, such as redwood, which is normally susceptible to damage if subjected to rapid drying at elevated temperatures. Such high moisture content lumber is subject to damage in the form of collapse and honeycombing and to shrinkage. It has been discovered that lumber may be upgraded and damage minimized when the lumber in green condition is pretreated by thorough freezing of its liquid fraction and then the pretreated lumber is dried rapidly by subjecting to conditions of low relative humidity and high temperature at least 30° F. above the critical temperature at which damage normally occurs, 110° to 120° F. in the case of redwood. Preferably at least a substantial portion of the pretreated lumber is permitted to thaw by returning to ambient temperature before rapid drying.

PATENTS

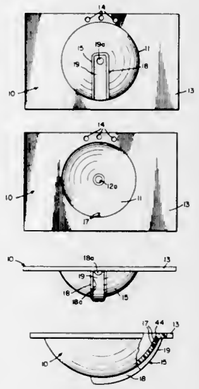
GRANTED MAY 18, 1971

GENERAL AND MECHANICAL

3,578,736
HAT AND SWEATBAND INSERT THERFOR
Norman L. Dootson, San Francisco, Calif., assignor to Winifred M. Colombo, Mill Valley, Calif., fractional part interest
Filed Oct. 20, 1969, Ser. No. 870,431
Int. Cl. A42b *1/02*
U.S. Cl. 2—181 **5 Claims**

A hat having a sweatband and an elongated readily insertable and discardable insert. The insert includes a perspiration absorbent face portion and a moisture impervious back portion with an upstanding central member. The central member extends above a sweatband to expose the absorbent portion to facilitate perspiration evaporation therefrom and to provide a grasping portion whereby the insert can be readily inserted or removed.

3,578,737
MONOLITHIC SINK AND VANITY TOP COMBINATION
Kay L. Ruggles; Dale B. Gunnerson, and Howard S. Clark, Salt Lake City, Utah, assignors to American Standard Inc., New York, N.Y. Division of Ser. No. 635,477, May 2, 1967, Pat. No. 3,496,612.
Filed July 15, 1969, Ser. No. 870,995
Int. Cl. A47k *1/04*
U.S. Cl. 4—166 **2 Claims**

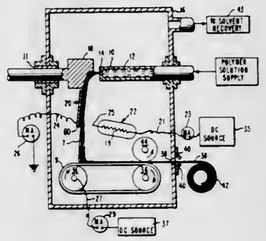


An integral sink and vanity top combination of a thermosetting synthetic plastic composition, preferably of a polyester resin type, wherein the bowl area is integrally formed with the vanity top area. The bowl area is provided with an overflow passageway that extends along the sidewall of the bowl. An improved combination having one or more sink bowls is disclosed and which is manufactured by a method which includes the steps of applying appropriate coating to the mold and thereafter applying an initial pour of the polyester resin into the mold, mounting an overflow tube in proximity to the bowl mold area, then applying a bonnet over the overflow tube and bowl area after the first pour has become tacky, and then making a second pour of the same material into the interior of the bonnet area over the first pour to form the bowl area to shape in integral assembly with the vanity top area. A mineral filler may be added to the resin for the initial pour to produce different desired finishes on the sink and vanity top combination. As the material is permitted to gel the mold is vibrated to permit entrapped gasses to escape to insure a product essentially free of pockets of entrapped air.

3,578,738
FLOOR MAT
Martin Robert Hughes, Grand Rapids, Mich., assignor to Bissell Inc., Grand Rapids, Mich.
Filed Feb. 25, 1969, Ser. No. 802,147
Int. Cl. A47l *23/22;* **A47g** *27/02*
U.S. Cl. 15—215 **6 Claims**

A floor mat having a thin perforate water-absorbent top layer for wiping the feet on. An intermediate spongy layer receives water, but no appreciable dirt, from the top layer and also reinforces the top layer against side loads. An imperforate tray supports both layers and serves as a water receptacle. Ribs on the tray assist in preventing sliding of the intermediate layer thereon. The tray is snap fit onto a clamping frame which also holds the edge portions of both layers in place.

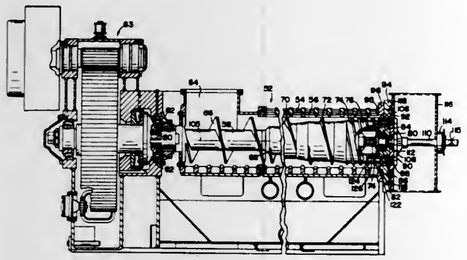
3,578,739
APPARATUS FOR APPLYING ELECTROSTATIC CHARGE TO FIBROUS STRUCTURE
Henry H. George, Berkeley Heights, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed May 13, 1969, Ser. No. 824,183
Int. Cl. D01d *9/00*
U.S. Cl. 18—8 **8 Claims**



An apparatus for electrostatically charging fibrous material being forwarded in a linear path that includes an ion gun and an opposed grounded target electrode positioned on opposite sides of the path. The electrode has a surface facing the ion gun that is covered by a dielectric material having a re-

sistance measured at about 65° C. of between about 1×10^6 and 10^{10} ohms. Covering materials with resistances in this range minimize the disruptive effect on continuity of operation of polymer buildup on the target electrode.

3,578,740
DEWATERING PELLETIZER APPARATUS
Billy J. Redding; John T. Steadman, and Lorel J. Bragg, St. Albans, W. Va., assignors to Goodrich Gulf Chemicals, Inc.
Filed Oct. 8, 1968, Ser. No. 765,758
Int. Cl. B29f *3/00*
U.S. Cl. 18—12 **10 Claims**

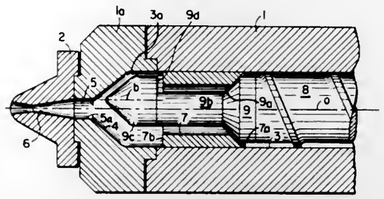


Disclosed is a dewatering pelletizer apparatus and method for dewatering and reducing the size of wet polymeric material.

The apparatus is comprised of an elongated barrel housing having an input end and an output end. Escape passages are provided in the barrel wall to permit the escape of liquid from the interior of the housing. A rotatable shaft having screw flights therein is disposed axially within the housing with one end of the shaft disposed within the output end of the housing. A bearing boss is supported within the housing and provides a bearing support for the shaft end. A generally annular screw flight section is secured to the shaft end and is defined by external and internal screw flights. The annular space between the external screw flight and the internal wall of the housing defines a discharge passage for polymeric material. The internal screw flight of the annular screw flight section is disposed closely adjacent the bearing boss thereby preventing polymeric material from entering the bearing chamber. An oil seal is provided adjacent the bearing and extends from the bearing boss into contact with the shaft. A secondary internal screw flight member is secured to the shaft closely adjacent an annular sealing wall extending from the bearing boss. The secondary internal screw flight member and the internal screw flight of the annular screw flight section cooperate to prevent polymeric material from entering the bearing chamber. A generally circular die plate is secured to said housing in blocking relationship to the output end thereof. A plurality of circumferentially spaced apertures are defined in the die plate. A high-speed cutting blade is disposed adjacent the die plate and is adapted to cut the extruded polymeric material into flakes as it emerges from the die plate.

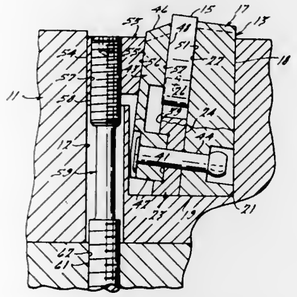
3,578,741
VALVE FOR A PLASTIFYING DEVICE
Armin Blumer, Schwanden, Switzerland, assignor to Maschinenfabrik und Giesserei Netstal AG, Netstal, Switzerland
Filed May 27, 1969, Ser. No. 828,117
Claims priority, application Switzerland, May 31, 1968, G8198/68
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 **11 Claims**

In a plastifying device, a valve member is provided on the leading end of a worm for regulating flow to an injection head. The valve is displaceable in the axial direction of the worm and it has a head portion on its leading end, the axis of which is offset from the axis of the worm so that, as the worm rotates, the head continuously affords a partial closure for



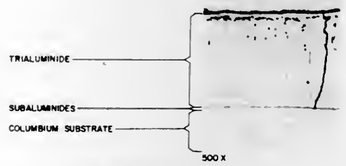
the end of the bore containing the worm and effects a mixing action as the material is fed to the injection head.

3,578,742
THROW-AWAY TOOL INSERT
William J. Manthei, Detroit, Mich., assignor to Kelsey-Hayes Company
Filed Feb. 27, 1969, Ser. No. 802,993
Int. Cl. B26d *1/00, 1/12*
U.S. Cl. 29—96 **2 Claims**



A machining tool for forming a surface and including a plurality of removable tool holders each of which holds one or more throwaway tool inserts. The tool holders are constructed so as to rigidly hold the tool inserts for precluding damage to the cutting edges of these inserts. In addition, the tool holders accurately locate the individual tool inserts.

3,578,743
ALUMINUM COATED COLUMBIUM BASE ALLOYS
Elihu F. Bradley, West Hartford, Conn.; Edwin S. Bartlett, Worthington; Horace R. Ogden, and Robert I. Jaffee, Columbus, Ohio, assignors to United Aircraft Corporation, East Hartford, Conn.
Continuation of application Ser. No. 502,650, Oct. 22, 1965, now abandoned. This application Jan. 13, 1969, Ser. No. 791,880
Int. Cl. B32b *15/18*
U.S. Cl. 29—194 **20 Claims**

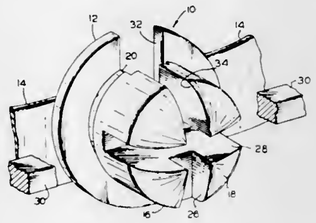


PHOTOMICROGRAPH IN PLAIN LIGHT OF TRIALUMINIDE COATING OVER UNALLOYED Cb

This invention provides protective coatings for columbium alloys. The coatings comprise columbium aluminide modified

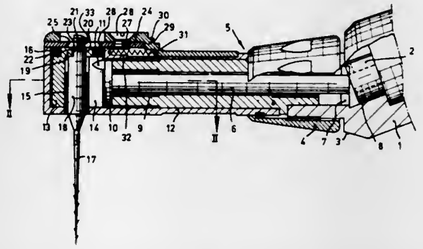
by titanium and one or more of the following comodifiers Cr–, V–, Mo–, and Mo–Ta. The coatings can be provided by coating with aluminum a substrate consisting of columbium alloyed with these modifiers. The modified columbium aluminide coatings may remain on the substrate on which they are produced, or they can be removed from the original substrate and applied to other Cb-alloy substrates. Exemplary of the protective coatings of this invention are (*a*) a coating consisting essentially of columbium aluminide modified by 7 percent of Ti and 9 percent Mo, (*b*) a coating consisting essentially of columbium aluminide modified by 7 percent of Ti and 4 percent of V, (*c*) a coating consisting essentially of columbium aluminide modified by 8 percent of Ti and 4 percent of Cr, and (*d*) a coating consisting essentially of columbium aluminide modified by 8 percent of Ti, 11 percent of Ta, and 11 percent of Mo.

3,578,744
METHOD AND APPARATUS FOR ORTHODONTIC TREATMENT
Alexander J. Wildman, Eugene, Oreg., assignor to Alexo, Corp., Eugene, Oreg.
Filed Sept. 12, 1969, Ser. No. 857,351
Int. Cl. A61c *7/00*
U.S. Cl. 32—14 **9 Claims**



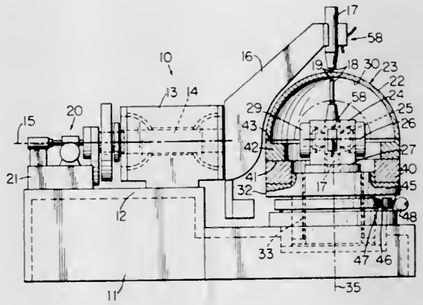
After securement of brackets of novel design to teeth of a patient to be treated, impression is taken of the mouth. The impression is removed, replicas of brackets are inserted in impression and casting made of teeth which are then separated and positioned in ideal location in a model. Arch wires are then preformed to fit brackets on ideal model and after preforming, arch wire transferred to mouth of patient. Brackets have groove to receive arch wire which is locked in place by follower and snap ring.

3,578,745
DENTAL INSTRUMENT
Marcel Garnier, 6 Rue St. Antoine, Besancon, and Roger Blanc, Chambery, France
Continuation-in-part of application Ser. No. 438,364, Mar. 3, 1965, and a continuation-in-part of 494,629, Oct. 11, 1965. This application May 6, 1968, Ser. No. 726,777
Int. Cl. A61c *5/02*
U.S. Cl. 32—57 **5 Claims**



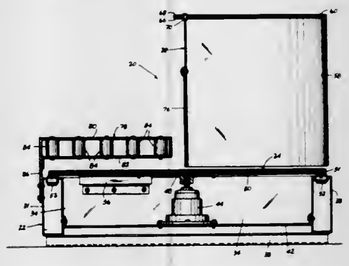
In a dental instrument for the treatment of dental roots by dental instruments such as broaches or reamers, means are provided for causing the instrument to alternately rotate in one direction and in the opposite direction, the means causing an angle of rotation of the instrument which is at the most equal to the angle which corresponds to its yield strength, or elastic limit.

3,578,746
GAGING APPARATUS AND METHOD
John H. Walker, Dayton, Ohio, assignor to The Bendix Corporation
Filed Feb. 13, 1969, Ser. No. 799,047
Int. Cl. G01b *13/02*
U.S. Cl. 33—174 **23 Claims**



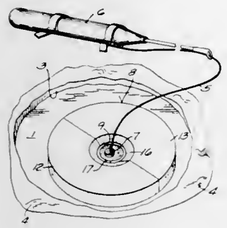
An apparatus for and method of controlling the force exerted by a gaging probe against a workpiece wherein gaging movement of such probe is provided along a rectilinear path coinciding with a longitudinal axis of the probe and the force exerted by the probe is kept substantially constant at all angles of inclination of the longitudinal axis of the probe relative to a reference plane.

3,578,747
SHRINK TUNNEL WITH TURNTABLE
Richard F. Schramm, St. Louis, Mo., assignor to Speed Equipment Incorporated, St. Louis, Mo.
Filed Jan. 3, 1968, Ser. No. 695,408
Int. Cl. F26b *11/00*
U.S. Cl. 34—184 **6 Claims**



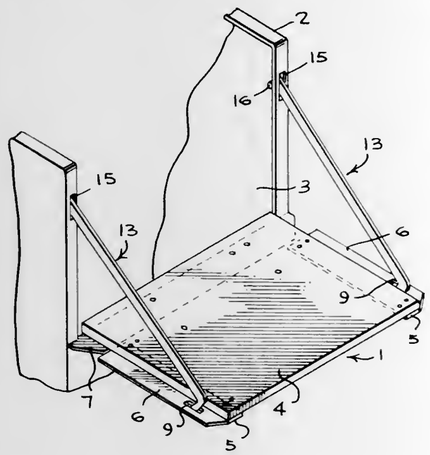
A portable shrink tunnel with turntable means for heat shrinking plastic film about various objects to be wrapped. The shrink tunnel is provided with a turntable disc having a loading station in which the objects are wrapped and placed on the turntable, a heat-shrinking station within an overlying shrink tunnel that may be expandable to cover one-quarter to one-half of the turntable, and a discharge station on the turntable which is adjacent the receiving station. The turntable is constantly rotated and carries the objects to be wrapped 360° from the receiving station, through the shrink tunnel, and the discharge station. The shrink tunnel is composed of two arcuate housing sections telescopically adjustable to vary the tunnel length, and provide a means for controlling the tunnel heat supplied in the tunnel and also to vary the area of the loading or receiving station. A heating element may be positioned underneath the turntable disc at the receiving station to heat the disc which aids in maintaining the wrapping film about the article to be wrapped before it is charged to the heat shrink tunnel.

3,578,748
ICE FISHING HOLE COVER
Raymond M. Hurd, 2548 S. 78th St., Milwaukee, Wis.
Filed Feb. 11, 1969, Ser. No. 798,396
Int. Cl. A01k *93/00, 97/12*
U.S. Cl. 43—44.9 **7 Claims**



A buoyant cover for an ice fishing hole is formed as a centrally split, two-piece plate member having recesses defining a fishing line opening. The opposed edges of the pieces are releasably connected by an adhesive greaselike substance. The plate member is covered with a water-repellent material and has a black coating on its top surface to absorb heat.

3,578,749
SELF-LOCKING DROP-DOOR
Homer G. Woten, 912 Perrin Ave. N. W., Winter Haven, Fla.
Filed May 5, 1969, Ser. No. 821,714
Int. Cl. E05f *1/00*
U.S. Cl. 49—387 **4 Claims**

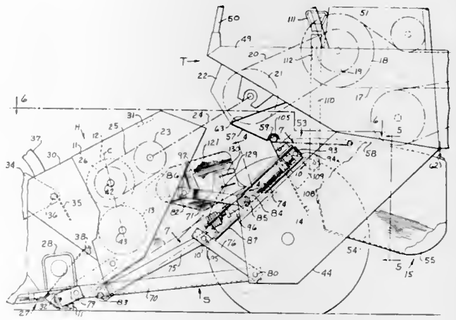


A drop-door hinged at the bottom to an enclosure, and having support bars pivotally connected to the door and slidable through slots in the enclosure adjacent the opening closed by the door. The support bars are angular, with short arms adjacent the door to move into the slots in the enclosures, and counterweight arms to move about the bottoms of the slots in the enclosures as fulcrums to assume downwardly depending self-locking positions.

ERRATUM

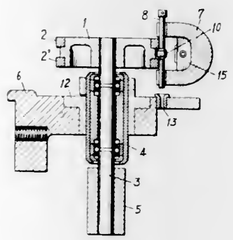
For Class 52—156 see:
Patent No. 3,578,156

3,578,750
CROP GUIDING AND ARRANGING MEANS FOR A SELF-PROPELLED HARVESTING MACHINE
Lawrence M. Halls, New Holland; Henry N. Lausch, Leacock, and Bruce D. Schwalm, Leola, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed Apr. 3, 1969, Ser. No. 813,219
Int. Cl. A01d *43/00*
U.S. Cl. 56—23 **11 Claims**



Crop guiding and arranging means are mounted on two suspension assemblies supporting a wide header on a narrower self-propelled tractor and on the tractor for guiding and deflecting crops cut by a header into windrows or swaths.

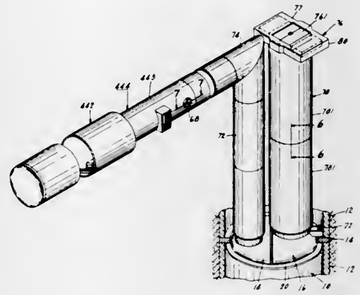
3,578,751
APPARATUS FOR DRIVING SPINDLE FOR EFFECTING FALSE TWISTING OF YARNS
Nobuhisa Kodaira, 7-10, Kami-Renjyaku 2-chome, Mitaka, and Norio Motegi, 2-8, Sakura 1-chome, Norio, Tokyo, Japan
Filed July 14, 1969, Ser. No. 841,438
Claims priority, application Japan, Aug. 21, 1968, 43/59192
Int. Cl. D01h *7/92*
U.S. Cl. 57—77.45 **5 Claims**



An apparatus for driving a spindle for effecting false twisting of yarns in which a drive roller frictionally contacts a spinner to rotate it with high speed. Said spinner loosely fits in the grooves formed in the ends of a fixed magnet.

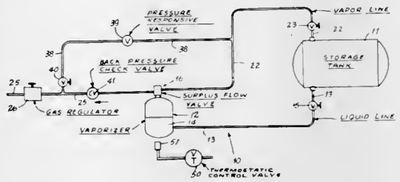
The portions of the spinner loosely fit in grooves of a fixed magnet having a polarity the same as the polarity of corresponding grooves of the fixed magnet respectively whereby due to repulsion produced between the polarities, said spinner is urged to abut said drive roller and also its rocking motion is avoided. In front of respective poles of said fixed magnet, a metal plate of high permeability is provided with an airgap therebetween to increase magnetic flux density of said polarity portions.

3,578,752
SEGMENTED BULKHEAD FOR TUNNELS AND THE LIKE
Richard W. Stevens, Oconomowoc, Wis., assignor to Milwaukee Boiler Manufacturing Company, Milwaukee, Wis.
Filed Sept. 23, 1968, Ser. No. 761,770
Int. Cl. E02d *23/00*
U.S. Cl. 61—83 **4 Claims**



A circular bulkhead is formed of a pair of segments and is capable of assembly and erection within the confines of a tunnel. The generally semicircular segments include means for joining the segments together to form the completed bulkhead.

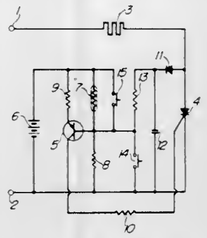
3,578,753
LIQUEFIED PETROLEUM VAPORIZER WITH AUTOMATIC VAPORIZER BYPASS
William P. Freeman, Jr., Dallas, Tex., assignor to John E. Mitchell Company, Dallas, Tex.
Filed Feb. 28, 1969, Ser. No. 803,185
Int. Cl. F17c *9/02*
U.S. Cl. 62—51 **6 Claims**



A liquid petroleum vaporizer with means to supply vapor from a storage tank under conditions of demand in excess of the capacity of the vaporizer and with an automatically operable valve-controlled line bypassing the vaporizer when the vapor in the storage tank is adequate to supply the demand.

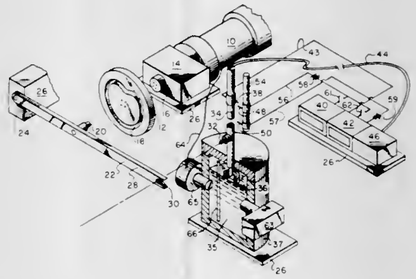
3,578,754
DEFORSTING CONTROLLER FOR ELECTRIC REFRIGERATOR
Zenji Kusuda, Ibaragi-shi, and Takeji Kobayashi, Kyoto, Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan
Filed Feb. 25, 1969, Ser. No. 802,035
Claims priority, application Japan, Mar. 1, 1968, 43/13925
Int. Cl. F25d *21/06*
U.S. Cl. 62—156 **4 Claims**

A defrosting controller for electric refrigerators which is operated under control of a first transistor adapted for triggering a silicon-controlled rectifier depending upon the result detected by a temperature detector in the freezer of the refrigerator and under control of a second transistor for keeping the first transistor in one state during the defrosting operation so that the defrosting operation is automatically stopped as soon as the temperature within the freezer reaches a predetermined temperature after starting the defrosting operation. Thus, frost accumulated within the freezing compartment can completely be removed and an un-



necessary temperature rise within the freezing and provisions compartments can be prevented.

3,578,755
RESPONSE ANALYZER FOR SENSORS
Bobby G. Bynum, and Drayton H. Talley, Huntsville, Ala., assignors to the United States of America, as represented by the Administrator of the National Aeronautics and Space Administration
Filed July 30, 1969, Ser. No. 845,991
Int. Cl. G01f *25/00*
U.S. Cl. 73—1R **7 Claims**

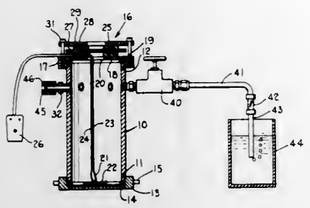


The invention is an apparatus for measuring the performance of liquid level sensors under dynamic conditions. The apparatus includes a motor driven cam having a cam groove formed therein. A cam follower riding in the cam groove drives a pivotally mounted lift rod which in turn drives a slide rod to which a sensor being tested is attached. The slide rod is positioned with respect to a container such that the attached sensor is moved in and out of a liquid in the container. A first signal generating means is provided that indicates when the sensor actually first enters the liquid and another signal is generated by the sensor when it senses entering the liquid. By monitoring the time lapse between the signals it is possible to determine the response characteristics of the sensor upon entry into a liquid. A camera and light source are utilized to photograph conditions within the container during test of a sensor.

3,578,756
AUTOIGNITION TEST CELL
Fred D. Evans, Oviedo; Carlos L. Springfield, Titusville, and Coleman J. Bryan, Merritt Island, Fla., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed July 30, 1969, Ser. No. 845,971
Int. Cl. G01n *25/00*
U.S. Cl. 73—15 **1 Claim**

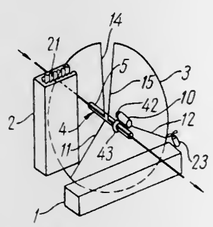
A chamber for analyzing test samples of materials, such as used in spacecrafts, under certain predetermined environmental conditions in order to determine autoignition temperatures and degree of decomposition is controlled atmospheres. The apparatus includes an elongated hermetically sealed cylindrical chamber which has a plurality of couplings

carried thereon. A vacuum pump, a source of gas, a bubbler system which bubbles through a mercury bath, a valve and other various items may be coupled to the couplings in order



to produce predetermined environmental conditions within the chamber. The chamber is also provided with a viewing port and a thermocoupled probe for measuring the temperature of the test sample.

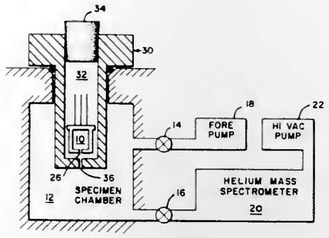
3,578,757
CHROMATOGRAPH FOR DETERMINATION OF ADMIXTURES IN GASES
Viktor Ivanovich Samuilov, oblast, Leninsky Raion doma Uniigaz, 4A, Kv.59, Moskovskaya Oblsst; Jury Markovich Genkin, ulitsa Usacheva, 62, Kv.254, and Maria Dmitrievna Suvorova, Simonovsky val., 12, Kv. 171, Moscow, U.S.S.R.
Filed July 12, 1968, Ser. No. 744,517
Int. Cl. G01n *31/08;* **B01d** *15/08*
U.S. Cl. 73—23.1 **6 Claims**



A chromatograph for the determination of admixtures in gases, comprises a chromatographic column bent in the form of at least a single helix coil or an arc of circle and which is rigidly secured on the shaft of a drive device in a plane perpendicular to the axis of the shaft. The shaft is mounted in stationary supports so that at the same time one portion of the chromatographic column is immersed in a refrigerant bath and the other portion of the column is in a heater, and during the rotation of the shaft said portions of the column subsequently pass through the cooling and heating zones.

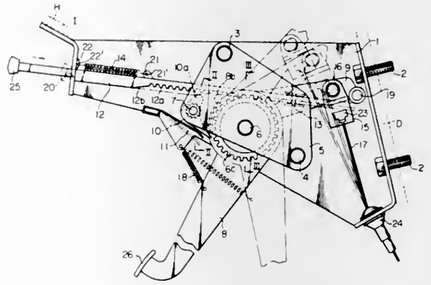
3,578,758
ORIFICE GROSS LEAK TESTER
Thomas L. Altshuler, West Concord, Mass. assignor to the United States of America as represented by the Administration of the National Aeronautics and Space Administration.
Filed May 7, 1969, Ser. No. 822,519
Int. Cl. G01m *3/16*
U.S. Cl. 73—40.7 **3 Claims**

An orifice leak tester for use with a helium mass spectrometer is disclosed. The leak tester comprises a sample chamber, wherein an article to be tested is supported on a wire screen; an orifice formed in a wall common to the sample chamber and mass spectrometer specimen chamber; and means for directing a purging gas over the orifice and through the sample chamber. A specimen pressurized with helium gas is introduced into the previously purged sample chamber. Helium gas effusing from a leaking specimen flows



through the pressure limiting orifice and is detected by the spectrometer.

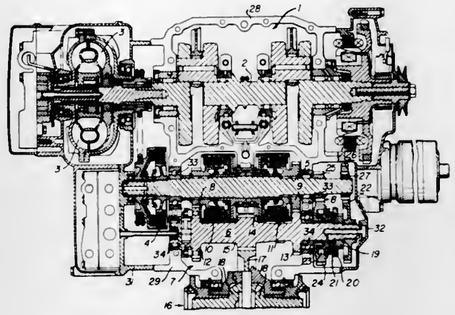
3,578,759
FOOT-OPERATED HAND-RELEASED BRAKE OF THE VEHICLE
Takeo Yamazaki, Anjo-shi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan
Filed July 28, 1969, Ser. No. 845,436
Claims priority, application Japan, Aug. 3, 1968, 43/55048
Int. Cl. G05g *1/14*
U.S. Cl. 74—540 **5 Claims**



A foot-operated and hand-released brake of the vehicle in which a pedal is oscillatably pivoted by a shaft rotatably mounted on a bracket and an internal gear is carried on the shaft rotatably and eccentrically to the shaft. The rotation of the shaft swings the internal gear in mesh with an external gear provided on the pedal concentrically to the shaft, and rotating the internal gear with a speed largely reduced due to the slight difference in the number of teeth in the gears. An arm fixed to the internal gear releases the brake cable depending on the amount of the rotation of the shaft.

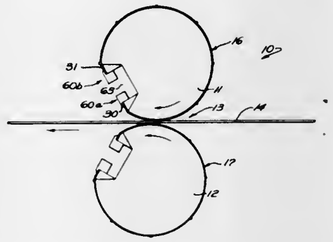
3,578,760
POWER TRANSMISSION APPARATUS
Kimino Shinmura, Tokyo, Japan, assignor to Kabushiki Kaisha Honda Gijutsu Kenkyusho, Saitama-ken, Japan
Filed Dec. 27, 1968, Ser. No. 787,404
Claims priority, application Japan, Jan. 17, 1968, 43/2147
Int. Cl. F16h *37/00;* **B60k** *17/06*
U.S. Cl. 74—701 **4 Claims**

A power transmission apparatus in which an input shaft driven by a prime mover is provided with respective driving gears for low-speed and high-speed operation and with spaced, respective hydraulic-operated frictional clutches for selectively connecting the gears to the shaft, there being an output shaft extending parallel to the input shaft and provided with spaced driven gears in mesh with respective driving gears and with an output gear partly projecting into the



space formed between the two clutches and directly driving an adjacent differential gear apparatus.

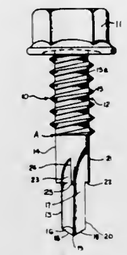
3,578,761
SEVERING APPARATUS
Albert J. Sarka, Fairview Park, Ohio, assignor to Harris-Intertype Corporation, Cleveland, Ohio
Filed Sept. 12, 1968, Ser. No. 759,275
Int. Cl. B23d *25/12;* **B26d** *1/56*
U.S. Cl. 83—343 **13 Claims**



Apparatus for severing material at selected locations comprises first and second dies. Each of the dies has sheet-severing elements in the form of narrow projections extending above the surface of the main body of the respective die. The sheet-severing elements define a layout of the selected material locations to be severed. At least one of the dies comprises a plurality of separate discrete die sections. An additional die section is provided as a replacement for each die section in the event of damage thereto.

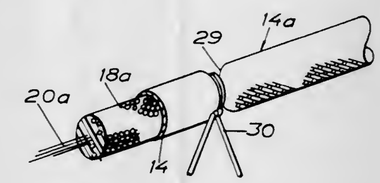
3,578,762
SELF-DRILLING, REAMING AND TAPPING SCREW
George Siebol, Orange, and Robert F. Kolec, Whittier, Calif., assignors to Armco Steel Corporation, Middletown, Ohio
Filed Apr. 14, 1969, Ser. No. 815,825
Int. Cl. F16b *25/00*
U.S. Cl. 85—41 **2 Claims**

A fastener comprising a screw having a head adapted to be engaged by means whereby it may be rotated so as to force it into a workpiece or the like at one end and a workpiece-engaging point at the other end. This fastener is designed to have the maximum tensile strength in the total fastener. To this end the shank of the screw, between the point and head, is formed into three sections. The first section, moving from the point towards the head, is of relatively small diameter and is provided with a pair of cutting edges having flutes extending therefrom whereby this section functions as a pilot drill, The next or intermediate section is of larger diameter. The aforementioned grooves or flutes extend into this section and define a second pair of cutting edges. Additionally, however, this intermediate section is provided with other cutting edges and flutes whereby this intermediate section constitutes a reaming section having multiple cutting edges with flutes extending therefrom These drilling and reaming sections are designed to give a positive round hole of the proper diameter so that the threaded section can engage the sides of the hole and distort the sheet metal enough so that a firm



fastening is accomplished. The third section, therefore, that immediately adjacent the head, is provided with self-tapping screw threads of substantially constant diameter and uninterrupted by any grooves, flutes or the like.

3,578,763
FLOATABLE CORDS
Jan Hendrik Platou, Birkelundsbk 76, Paradis, near Bergen, Norway
Filed Mar. 12, 1968, Ser. No. 712,445
Int. Cl. D04c *1/12*
U.S. Cl. 87—6 **6 Claims**

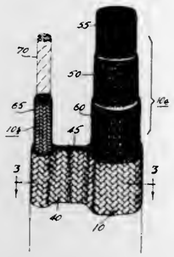


A flexible floatable cord for use in fishing nets, trawls, water skiing and the like, which comprises a braided sleeve, a core of continuous filament threads incorporated therein and particles of an expanded plastic material disposed between said sleeve and said core, said particles being only attached to one another and to the sleeve and the core and forming a continuous cord in which the core is embedded. Further a process and an apparatus for producing said flexible floatable cord.

3,578,764
OVEN DOOR SEAL AND METHOD OF MAKING SAME
Robert L. Nunnally, Valley Forge, and Thomas L. Weil, Paoli, Pa., assignors to Bentley-Harris Manufacturing Company, Conshohocken, Pa.
Filed July 23, 1969, Ser. No. 844,083
Int. Cl. D04c *1/06*
U.S. Cl. 87—6 **9 Claims**

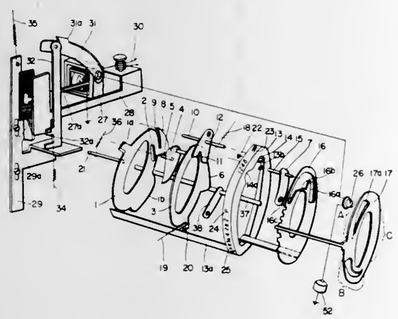
A heat-resistant gasket is provided for sealing a space between a door and a jamb around an access opening in an oven of the self-cleaning type. The gasket has a braided fiberglass jacket which has a line of juncture extending longitudinally to dispose a resilient metal mesh tubular sealing element and a tubular mounting element in spaced parallel relation therein, the mounting element being engaged by clamping means on the door which secures it thereto to dispose the sealing element in the space to be sealed. In addition, there is disclosed a method for fabricating the gasket which includes the steps of braiding the fiberglass jacket around both a knitted wire mesh core in the tubular sealing element and a paper core in the tubular mounting element as the elements advance in spaced parallel relation and joining

the braided jacket longitudinally between the elements by stitching, then shaping the sealing element, and heating the



gasket assembly to an elevated temperature to disintegrate the paper core and to set its shape.

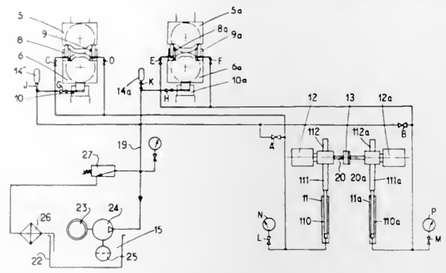
3,578,765
ELECTRIC EYE CAMERA
Tatsuo Kobayashi, Kaizuka, and Kayoshi Tsujimoto, Higashi, Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan
Filed Apr. 10, 1968, Ser. No. 720,091
Claims priority, application Japan, Apr. 12, 1967, Apr. 13, 1967, Apr. 28, 1967, 42/23064;42/30516;42/27300
Int. Cl. G03b *7/12, 9/00*
U.S. Cl. 95—10 **13 Claims**



An electric eye camera to be operated either in a programmed exposure control mode or in an automatic exposure control with priority on shutter speed mode. The camera has a changeover ring to facilitate selection of the mode by simple operation. A lens aperture control ring is used to inhibit the mode of operation with priority on shutter speed as long as the lens aperture control ring is away from its initial position.

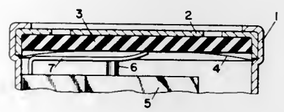
3,578,766
VARIABLE PRESSURE EMBOSSING MACHINE
Lucien Diolot, Neuilly Sur Seine, France, assignor to Societe Nouvelle Spidem, Paris, France
Filed Apr. 4, 1967, Ser. No. 628,325
Claims priority, application France, Apr. 4, 1966, 56353
Int. Cl. B44b *5/00;* **B30b** *3/04*
U.S. Cl. 101—23 **8 Claims**

An embossing machine having means to vary the pressure of the cooperating embossing rolls employing hydraulic power cylinders to provide the substantially constant main force pressing the embossing cylinders together. Control hydraulic jacks are placed operatively between the cylinders to press them apart with a predetermined selected pressure to thereby selectively vary the resultant engaging pressure of the cylinders. Preferably, the jacks and power cylinders receive their hydraulic fluid from the same supply and the jacks are provided with motor reducer control units that may be coupled together for simultaneous adjustment of the jacks on each axial end of the cylinders or uncoupled for separate



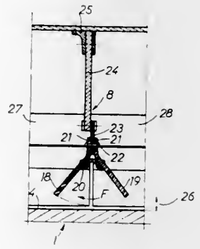
adjustment. Also, the jacks are retractable along with the upper cylinder supporting structure so that the cylinders may be easily removed and replaced.

3,578,767
SAFETY AND ARMING DEVICE
John T. M. Lee, Tamaqua, Pa., assignor to Atlas Chemical Industries, Inc., Wilmington, Del.
Filed Dec. 11, 1968, Ser. No. 782,886
Int. Cl. F42c *15/32*
U.S. Cl. 102—70.2 **4 Claims**



A safety and arming device activated by contact with a liquid activator and armed by the evaporation of the liquid. An element of the device expands when contacted by the liquid activator and contracts when the liquid evaporates; the expansion of this element collapses a member and the element's subsequent contraction activates a switch which arms the device.

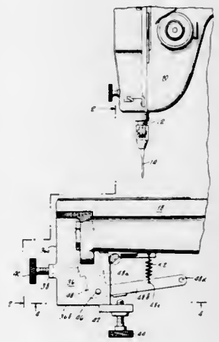
3,578,768
PARTITIONING SYSTEM FOR FLUID CUSHIONS IN GROUND EFFECT MACHINES
Francois L. Giraud, Plaisir, France, assignor to Societe De L'Aerotrain, Paris, France
Filed June 27, 1968, Ser. No. 740,498
Claims priority, application France, Oct. 4, 1967, June 19, 1968, 123,278;155,691
Int. Cl. B61b *13/08*
U.S. Cl. 104—23 **15 Claims**



An arrangement for partitioning the compressed fluid cushion of ground effect vehicles and the like machines, said

arrangement including dihedral-shaped partitions extending across the cushions and facing one of the walls along which the machine is guided and sustained, said dihedral defining a compartment on either side of same; the outer edges of the elementary partitions facing said wall and normally oblique with reference thereto are separated by a clearance from said wall and by reason of the pivotal securing of the dihedral to the machine along the ridge of said dihedral, any leak of fluid in one of the compartments produces a shifting of the elementary partition bounding the opposite compartment so as to throttle the corresponding clearance and to cut off the leaking compartment.

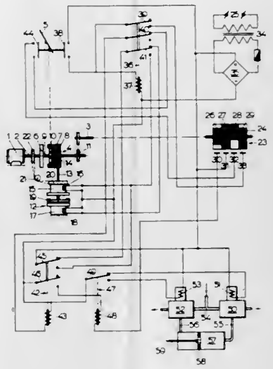
3,578,769
DIFFERENTIAL FEED ATTACHMENT MEANS FOR SHIRRING
Edward L. Seaman, 65 Harvard St., Garden City, N.Y.
Filed May 1, 1969, Ser. No. 820,995
Int. Cl. D05b *27/08*
U.S. Cl. 112—208 **4 Claims**



A differential feed attachment means for a drop feed sewing machine, said attachment being intended to replace the conventional feed dogs and consisting of two feed dogs arranged in tandem with the front feed dog being adjustable through a lever system relatively to the rear feed dog so that the amount of travel of the front feed dog can be in unison with the rear feed dog and may be quickly and easily varied by the operator while the machine is in motion to continuously or intermittently gather or shirr material being operated upon.

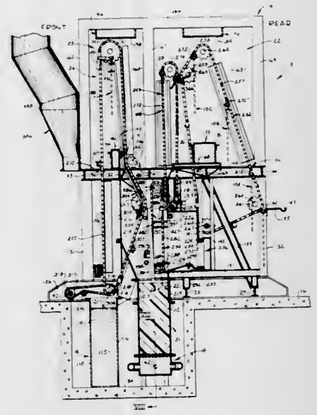
3,578,770
SEWING MACHINE
Johannes Franciscus Van Hazendonk, Zwanenburg, Netherlands, assignor to "De Jong & De Vlieger Machinehandel N.V.", Zwanenburg/Halfweg, Netherlands
Filed Dec. 18, 1968, Ser. No. 784,770
Claims priority, application Netherlands, Dec. 29, 1967, 6717780
Int. Cl. D05b *69/26, 65/02*
U.S. Cl. 112—219 **5 Claims**

A sewing machine is disclosed having a treadle-operated main clutch, an electromagnetic clutch and brake unit, a thread cutoff and an electric control circuit comprising a rotating needle positioning device. On pressing the treadle forwardly the main clutch is actuated whereby the driving motor of the machine drives the latter at the full operating speed and on subsequent disengagement of the treadle the electromagnetic clutch is actuated whereby the drive motor drives the machine through a reduction gear at a reduced needle positioning speed until the needle has reached its lowest position and is stopped by the actuation of the electromagnetic brake. When the treadle is moved from its forward position through its rest position to a rear position, the electromagnetic clutch remains energized until the machine has moved the needle to its highest position and is then



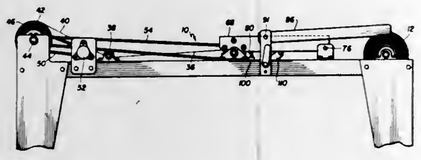
stopped. The thread cutoff is electrically actuated during the movement of the needle from its lowest to its highest position.

3,578,771
COATING APPARATUS INCLUDING PLURAL, SEQUENTIAL CONVEYING MEANS
John W. Black, Prairieville Township, Barry County, Mich., assignor to Pemco Wheel Company, Kalamazoo, Mich.
Filed Mar. 22, 1967, Ser. No. 625,123
Int. Cl. B05c *11/00*
U.S. Cl. 118—6 **13 Claims**



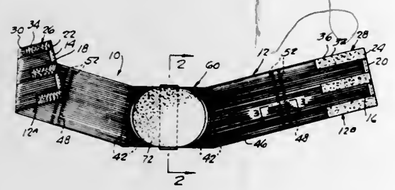
Plural treating stations comprise two downwardly opening ovens facing respectively an upwardly opening fluidized bed coating tank and a quench tank. An endless conveyor means conveys the article to be treated into and out of the first oven and delivers same to a second endless conveyor means which conveys the article into and out of the fluidized coating tank. Third endless conveyor means transfers the article from said second to a fourth endless conveyor means which conveys same into and out of the second oven and the quench tank.

3,578,772
APPARATUS FOR APPLYING A COATING TO SHEET MATERIAL
Robert B. Taylor, and Robert G. Walker, Fort Wayne, Ind., said Walker assignor to Allan W. Pedden, Fort Wayne, Ind.
Division of Ser. No. 462,506 June 9, 1965, Pat. No. 3,436,232.
Filed Mar. 13, 1969, Ser. No. 840,860
Int. Cl. B05c *1/00, 11/00*
U.S. Cl. 118—33 **1 Claim**



An apparatus for applying a coating of paraffin to one side of a sheeting material having an applicator roll which is rotatable mounted in a container of liquid paraffin so that a lamination of paraffin is transferred to the face of the sheeting material and an adjustable brake having a pivotable crossbar provided with a friction pad for engagement with the supply roll for controlling the tension of the sheet material as it is drawn through the apparatus.

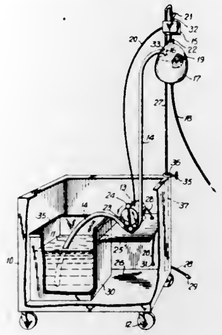
3,578,773
SUPPORTIVE ORTHOPEDIC DEVICE
August L. Schultz, 214 N. Harmon Drive, Mitchell, S. Dak.
Filed Oct. 28, 1968, Ser. No. 771,140
Int. Cl. A61f *5/02*
U.S. Cl. 128—78 **1 Claim**



An orthopedic appliance including a flexible and elastic body-engageable and conformable belt having a pressure pad slidably mounted on the inner side thereof for application on the torso of the wearer to provide support and pressure in any preselected position on the circumference of the torso between the lower scapular area and the sacroiliacs.

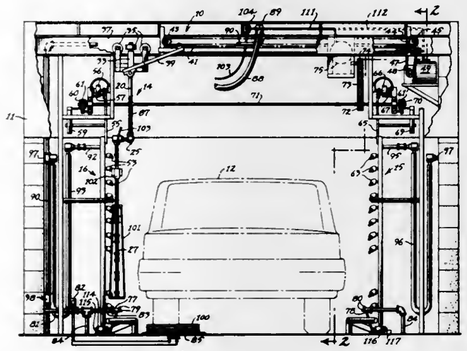
3,578,774
UROLOGICAL ENDOSCOPIC IRRIGATION MACHINE
Harold P. McDonald, Jr., Garden City, N.Y. (University of Tenn. College of Medicine, Urology Dept. 858 Madison Ave., Memphis, Tenn. 38103)
Filed Aug. 7, 1969, Ser. No. 848,170
Int. Cl. A61m *7/00*
U.S. Cl. 128—227 **8 Claims**

A urological endoscopic irrigation machine which consists of a cabinet for holding tank of irrigation fluid which is pumped through a tube into a reservoir bag at an elevated height. A membrane filter is connected on the input of the bag to filter out bacteria from the irrigant pumped from the tank. The bag is supported from a weight-sensitive switch which is responsive to the weight of the bag and its contents so that, as the fluid level in the bag drops, the weight-sensitive switch will automatically operate the pump to refill the



bag to a predetermined level so as to maintain its constant supply of irrigation fluid for the patient.

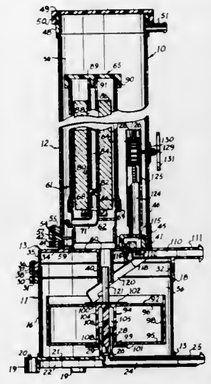
3,578,775
VEHICLE-WASHING APPARATUS
James W. McMillen, 2011 Belmont Blvd., Nashville, Tenn.
Filed Feb. 20, 1969, Ser. No. 800,904
Int. Cl. B60s *3/04*
U.S. Cl. 134—45 **10 Claims**



A vehicle-washing apparatus having a longitudinally disposed overhead spray frame supporting longitudinally spaced spray heads for reciprocable movement transversely above a vehicle to be washed, and a pair of vertically disposed side frames supporting vertically spaced side spray heads and mounted for reciprocable movement longitudinally along opposite sides of the vehicle. The overhead frame may include depending end frames having vertically spaced end spray heads for washing the opposite ends of the vehicle, and the overhead spray heads may be arranged at different elevations to define the contour of the vehicle.

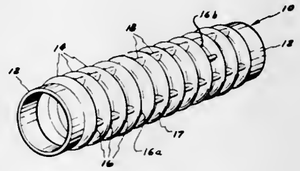
3,578,776
CHEMICAL FEEDER
Thomas E. Schneider, Jr.; Marion R. Carstens, Atlanta, and Homer J. Bates, Roswell, Ga., assignors to Tesco Chemicals, Inc., Atlanta, Ga.
Continuation-in-part of application Ser. No. 579,253, Sept. 14, 1966, now Patent No. 3,057,624, which is a continuation-in-part of application Ser. No. 403,968, Oct. 12, 1964, now Patent No. 3,323,539. This application Aug. 22, 1968, Ser. No. 754,535
Int. Cl. B01d *11/02*
U.S. Cl. 137—268 **9 Claims**

A chemical feeder for feeding a chemical from a solid chemical compound into a stream of water. The feeder includes a housing divided into upper and lower chambers, a chemical container positioned in the upper chamber for receiving a solidified chemical compound, a liquid inlet conduit communicating with the upper chamber, a liquid exhaust conduit communicating with the lower chamber, valves controlling both conduits, and a float positioned in the lower chamber for operating both valves. The chemical container



includes a plurality of apertures at spaced intervals about its lower end, and a nozzle extending inwardly from its lower end for flowing liquid from the upper chamber into contact with the solidified chemical compound and eroding the compound from its lower end. The mixture of the liquid and chemical compound flows from the upper chamber to the lower chamber.

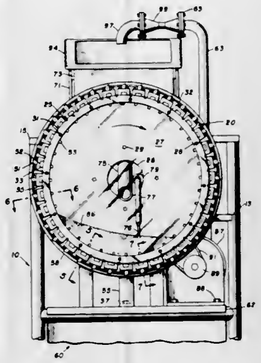
3,578,777
CORRUGATED TUBING
William J. DeGain, Warren, Mich., assignor to Koppy-Tool Corporation, Ferndale, Mich.
Filed June 11, 1969, Ser. No. 832,352
Int. Cl. F16l *9/06, 11/12*
U.S. Cl. 138—121 **28 Claims**



A corrugated tubing in which either the corrugation peak or root portions respectively and selectively are provided with longitudinal annularly spaced depressions or bulges connecting adjacent corrugation surfaces and in which selected peak or root diameters selectively may be different than the remaining peak or root diameters, such tubing when used as an energy-absorbing device having thereby a predetermined resistance of the corrugations to axial collapse loads and producing controlled degree and order of their collapse on subjecting the tubing to such axial loads.

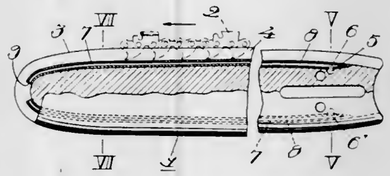
3,578,778
PACKAGING APPARATUS FOR FILLING INDIVIDUAL CONTAINERS
Ernest L. Matthews, and Ralph E. Matthews, Decatur, Ala., assignors to Matthew Machine Company, Inc., Decatur, Ala.
Filed Mar. 7, 1969, Ser. No. 805,149
Int. Cl. B65b *43/42;* **B67c** *3/00*
U.S. Cl. 141—144 **3 Claims**

A high productivity packaging apparatus and method are based on utilization of a container and a plurality of circular arranged valves which are connected to and rotate with the container. During rotation each valve draws a unit of material to be packaged from the container at one station, holds the



unit of material in the valve during continuing rotation and then discharges the unit of material at a discharge station to which empty containers are fed successively in synchronism with successive valves being discharged.

3,578,779
BAR FOR A CHAIN SAW
Kan Ishizaki, Tokyo, Japan, assignor to Shingu Shoko, Ltd., Otaru, Hokkaido, Japan
Filed Jan. 28, 1969, Ser. No. 794,659
Int. Cl. B27b *17/02, 17/12*
U.S. Cl. 143—32 **1 Claim**



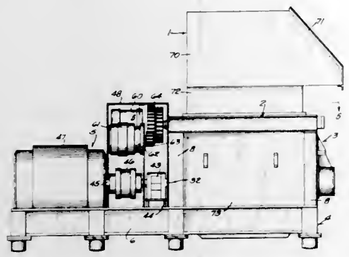
The present invention discloses a bar for a chain saw comprising a pair of parallel guide rails for a saw chain, a circumferential groove provided between said pair of guide rails and extending therealong, and an oil supply means having one or more ports facing to said groove, wherein a cover plate extending from one of said opening to a top portion of the bar is fixedly mounted within said groove and along a bottom portion thereof, thereby forming an oil passage, and oil supplied into the oil passage through said opening by the oil supply means can be discharged into the guide groove at the top portion of the bar.

3,578,780
APPARATUS FOR COMMINUTING MATERIALS
Norman J. Peters, Fond Du Lac, Wis., assignor to DEC International, Inc., Madison, Wis.
Filed Dec. 30, 1968, Ser. No. 787,805
Int. Cl. B02c *18/00;* **B26d** *9/00*
U.S. Cl. 146—79 **16 Claims**

An apparatus for comminuting and blending materials such as food products. The materials to be blended are initially fed into a shredder unit and the shredded materials are discharged to a comminuting or grinding unit.

The grinding unit includes a rotor which rotates within a perforated drum having a generally U-shaped cross section

and open ends. The material is introduced into the drum through the longitudinally extending opening and is forced outwardly through the perforations by the rotor and discharged to a hopper.

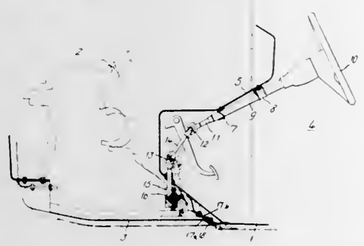


The drum is adapted to be slipped longitudinally over the rotor and rotor bearings and is retained within a fixed cage. The drum can be readily removed from the unit without removing the rotor or disassembling the bearings for the rotor shaft.

3,578,781
CLAY TREATING AND OIL-WETTING DISPERSION AND METHOD OF USE THEREOF
Albert Abrams; Harold J. Hill, and David R. Thigpen, Houston, Tex., assignors to Shell Oil Company, New York, N.Y.
Filed Dec. 31, 1968, Ser. No. 789,002
Int. Cl. E21b *43/25*
U.S. Cl. 166—305 **6 Claims**

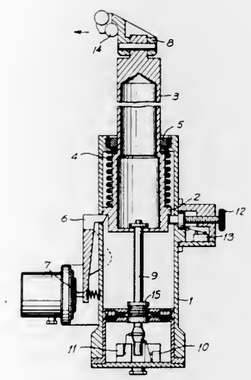
Permeability characteristics of a subterranean earth formation are improved by permeating them with a clay treating and oil-wetting dispersion of a surface active salt of a surface active cation and a surface active anion in an aqueous liquid solution containing electrolyte and water-soluble surfactant.

3,578,782
APPARATUS FOR THE RETRACTION OF A STEERING WHEEL OF A VEHICLE IN THE EVENT OF A FRONT END COLLISION THEREOF
Takeomi Miyoshi, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Oct. 29, 1969, Ser. No. 872,302
Int. Cl. B62d *1/18*
U.S. Cl. 180—82 **11 Claims**



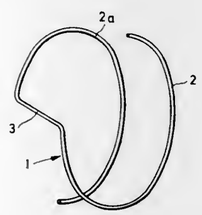
A steering wheel is connected to a shaft which in turn is connected to a steering mechanism in a housing so as to provide a steering connection, the housing being supported on a support frame which extends forwardly from the car body frame and is connected therewith along an inclined surface so that if the support frame is displaced rearwardly in the event of front end collision, the support frame is lowered where it is connected with the housing to cause the latter to be lowered and in turn cause the steering shaft to be retracted from the passenger compartment. The support frame may also be provided with a downwardly bent portion to achieve lowering of the housing and retraction of the shaft and steering wheel.

3,578,783
EXTRACTOR FOR AN UMBILICAL CONNECTOR OF A ROCKET
Pierre Loustalet, and Guy Roujas, Tarbes, France, assignors to The French State, France
Filed Nov. 5, 1969, Ser. No. 874,344
Claims priority, application France, Nov. 5, 1968, 172,592
Int. Cl. F03g *1/00;* **F15b** *15/26*
U.S. Cl. 185—37 **10 Claims**



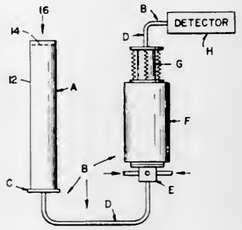
An extractor for an umbilical connector of a rocket comprises a hook of a piston rod engaging the connector, the piston rod being connected to a piston which is loosely fitted in a cylinder. A lock member engages the piston to hold the same in a ready or armed position in which a spring is compressed between the piston and cylinder. In a first mode of operation, a command signal is given to retract the lock member whereupon the piston is displaced by the spring and the hook pulls the umbilical connector to separate it from the rocket. In a second mode of operation, the hook remains in place and during rocket lift-off the umbilical connector tilts the piston past the lock member whereupon the piston is displaced by the spring to pull the umbilical connector and separate it from the rocket.

3,578,784
SPREADING SPRING FOR SPEED SELECTION AND SYNCHRONIZING DEVICES FOR MOTOR VEHICLES
Karl Ashauer, 318 Wolfsburg, Rabenhorst 2, and Dieter Manthey, 318 Wolfsburg, An der Kirchmesse 14, Wolfsburg, Germany
Filed Nov. 26, 1969, Ser. No. 880,120
Int. Cl. F16d *23/02*
U.S. Cl. 192—53R **4 Claims**



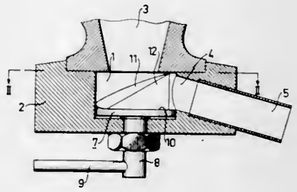
An annular-shaped spreading spring for speed selection and synchronizing devices for motor vehicles consisting of an integral wire with two winding loops interconnected by a crossover sector.

3,578,785
OUTLET PLUG AND CONDUIT FOR CHROMATOGRAPH
James A. Patterson, Los Altos, Calif., assignor to Sondell Research & Development Co., Palo Alto, Calif.
Filed Feb. 12, 1968, Ser. No. 707,016
Int. Cl. B01d *15/08*
U.S. Cl. 210—198 **11 Claims**



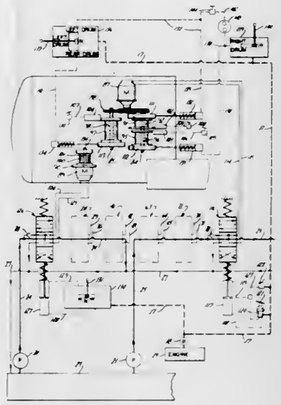
A chromatographic conduit forming a channel through which a continuous stream of eluate or classified fluids pass with minimal destruction of the classified state. The conduit commences at the output of a chromatographic classifying column and comprises reactors for processing the classified fluids, interconnecting tubes for transporting the classified fluids, and plugs for accommodating unavoidable changes in overall conduit cross section. The reactor and plugs define fluid-containing volumes, which volumes are packed with spherical particles to define intercommunicating spaces therein. These defined intercommunicating spaces prevent the fluid interfaces contained within the eluate from being dispersed over large and unobstructed areas wherein mixing due to turbulence and molecular migration may freely take place. The conduit, including the interconnecting tubing and reactor, is provided throughout with an essentially constant, effective cross-sectional area for fluid flow, which area permits uniform velocity in the fluid stream and gradual and uniform pressure drop therethrough.

3,578,786
DISCHARGE DEVICE FOR THE BOTTOM FRACTION AT A VORTEX-TYPE SEPARATOR
Ake Karl Gustaf Cras, Karlskoga, Sweden, assignor to Karl Arvid Skardal, Stockholm, Sweden
Filed July 3, 1969, Ser. No. 838,891
Claims priority, application Sweden, July 9, 1968, 9460
Int. Cl. B04c *5/16*
U.S. Cl. 210—512 **5 Claims**



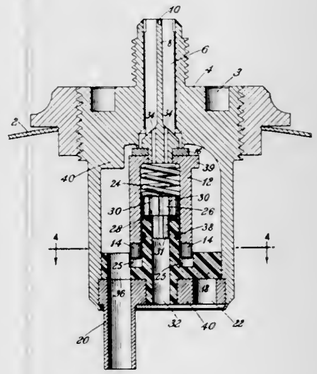
A device is provided for discharging the heavy bottom or reject fraction from a vortex-type separator and the device comprises a cylindrical vortex chamber which is connected to a bottom fraction outlet of the separator so as to receive the reject fraction therefrom in a manner producing a vortex flow in the vortex chamber. The vortex chamber is provided with an outlet port for the reject fraction and a flow-deflecting member is disposed within the vortex chamber for deflecting the vortex flow away from the circumferential wall of the vortex chamber at the location of the outlet port. The flow-deflecting member has an adjustable position in the vortex chamber so that the degree of deflection of the vortex flow from the location of the outlet port is determined by the position of the flow-deflecting member.

3,578,787
CONTROL SYSTEM
Alan E. Brickett, and Everett R. Windahl, Green Bay, Wis., assignors to Northwest Engineering Corporation, Green Bay, Wis.
Filed Nov. 12, 1968, Ser. No. 774,772
Int. Cl. B66c *23/06*
U.S. Cl. 212—59 **5 Claims**



A control system for a convertible pullshovel-crane wherein a plurality of hydraulic cylinders and/or hydraulic motors are actuated by a combination of air cylinders and hydraulic valves. In one embodiment, booster means for some of the hydraulic cylinders are provided with interlocks to prevent booster operation under certain conditions. In another embodiment, a plurality of hoist drums are controlled by the hydraulic motors, with the drums having both friction brakes as well as friction clutches to provide flexibility of cable control. Various bypasses and interconnections in the pneumatic circuit permit varying or fixing certain drum speeds.

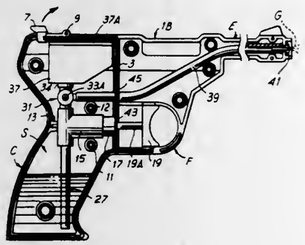
3,578,788
GAS LIQUID WITHDRAWAL VALVE
John J. Potter, Jr., and William J. Hamel, St. Albans, W. Va., assignors to Union Carbide Corporation, New York, N.Y.
Filed Nov. 13, 1968, Ser. No. 775,427
Int. Cl. B67b *7/24*
U.S. Cl. 222—4 **5 Claims**



A device is provided for attachment to the opening on top of a pressurized container and adapted to selectively

withdraw liquid or gas therefrom. It comprises a valve body adapted to be fitted to the opening of a container. The valve body is fitted with a disc valve having one or more openings which may be selectively rotated to vent either a tubular member extending from the valve body into the container so as to withdraw liquid, or an opening in the base of the valve body communicating with the gas above the liquid. A plunger, biased by a double-acting resilient member such as a spring, is provided in the top of the valve in order to externally vent the valve after the disc has been rotated to withdraw either liquid or vapor from the container. The double-acting resilient member is additionally biased against a pressure relief member in a housing within the valve body and an externally venting conduit is provided in the housing. In a preferred embodiment the housing coacts with the plunger and venting conduits are provided in the base of the plunger.

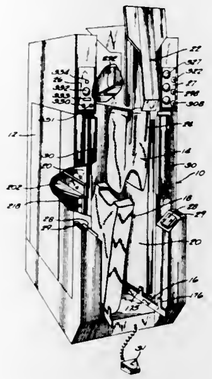
3,578,789
TOY GUN
Giampiero Ferri, Via Stoppani 38, Florence, Italy
Filed Apr. 11, 1969, Ser. No. 815,375
Claims priority, application Italy, Apr. 26, 1968, 4540A/68
Int. Cl. A63h *3/18*
U.S. Cl. 222—79 **13 Claims**



A water pistol which includes a main liquid reservoir formed in a part of the casing, a trigger-actuated pump for withdrawing liquid from the main reservoir, and a pressurized liquid reservoir mounted within the main reservoir. A three-way valve is connected between the pump and the pressurized reservoir to selectively supply liquid from the pump to the pressurized liquid reservoir, from the pump to the nozzle of the gun and to the pressurized liquid reservoir, or from the pressurized liquid reservoir to the nozzle.

3,578,790
CABINET PANTS PRESS
David L. Radford; Paul W. Frisby, Salt Lake City, and Francisco Muniz Filho, Taylorsville, Utah, assignors to McGraw-Edison Company, Elgin, Ill.
Filed Mar. 10, 1970, Ser. No. 18,215
Int. Cl. D06c *15/10;* **D06f** *59/00, 71/00*
U.S. Cl. 223—73 **24 Claims**

A one lay cabinet pants press comprising nested outer and inner bucks about which the pants waist portion can be dressed and held by overlying lap clamps, the lap clamps having a nominal clamping force for quick and accurate pants dressing under the clamps and a large clamping force for securely holding the dressed pants, the inner buck having a single intermediate support whereupon separation of the inner and outer bucks automatically expands the pants uniformly across the upper waist and lower seat portions thereof, cuff grippers and supporting parallel arm linkage therefor suitable to move the grippers to a dressing position near the waist bucks and an inspection position and a pressing position each further spaced from the waist bucks where the pants legs are drawn lengthwise and a brake device across the linkage effective to hold the pants legs as drawn, carriage support for the waist bucks, another parallel arm linkage supporting the grippers aligned with the waist bucks, structure connecting the carriage support and other linkage together suitable for moving them as aligned in unison between an outer dressing position and an inner pressing position, a fly press carried by the waist bucks to move



between a dressing position offset from the buck and a pressing position opposing the buck, and structure tying this movement of the fly press in unison to the buck carriage support.

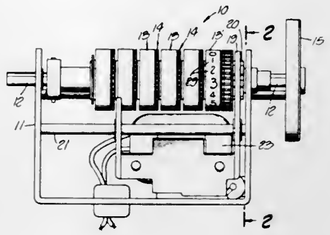
3,578,791
ENVELOPE OPENER AND ADVERTISING PIECE
George W. Davis, 1379 Venetian Way, Miami, Fla.
Filed Mar. 2, 1970, Ser. No. 15,604
Int. Cl. B65d *27/32;* **B43m** *7/00*
U.S. Cl. 229—85 **3 Claims**

The combination of an envelope having a triangular cutout at one corner defining a slit into the interior at the corner, and an insert within the envelope with a tab extending out of the corner. The insert has a slice edge extending at an angle from the tab so that when the insert is pulled from the envelope by the tab extending through the slit in the corner as it is pulled relative to the envelope, the slide edge which extends downwardly from the tab will slice the edge of the envelope. The insert also has a hooked portion to loosely captivate a piece of planar material in the hooked portion to be dragged from the envelope when the insert is removed from the envelope to drop free and to catch the attention of the recipient of the envelope as it falls.

3,578,792
DECADE COUNTER OR THE LIKE
John J. Affel, Canoga Park, Calif., assignor to International Telephone and Telegraph Corporation
Filed May 20, 1969, Ser. No. 826,131
Int. Cl. G06c *15/42*
U.S. Cl. 235—144 **9 Claims**

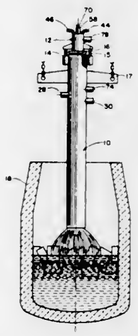
The invention includes, for example, a number wheel and a gearwheel. Both wheels have a star-shaped ratchet around

which a leaf spring fits. The spring holds the wheels together. The number wheel, thus, normally advances with the



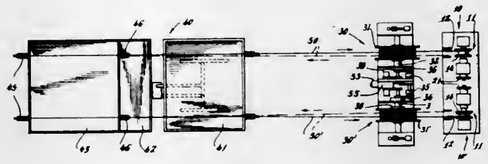
gearwheel. For reset, the number wheel may be turned relative to the gearwheel and the spring yields to allow such relative movement.

3,578,793
VARIABLE FLAME OXY-FUEL BURNER
Robert D. Jones, and Keith A. Miller, Allentown, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed May 29, 1968, Ser. No. 733,100
Int. Cl. B05b *15/00*
U.S. Cl. 239—132.3 **6 Claims**



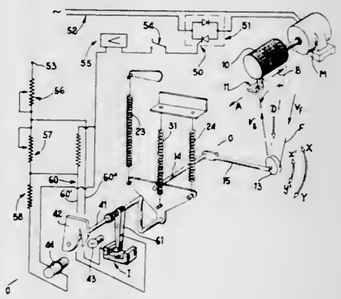
An oxy-fuel burner for use in a metallurgical furnace is disclosed which can be controlled to regulate the configuration of the burner flame to provide a flame shape varying from a wide "umbrella" shaped flame to a narrow "pencil" shaped flame. Several methods of using such burners in metallurgical furnaces are also disclosed.

3,578,794
SPOOLING APPARATUS
Edward E. Laird, 18 Pine Orchard Road, Branford, Conn.
Filed Jan. 16, 1969, Ser. No. 791,585
Int. Cl. B65h *54/00*
U.S. Cl. 242—25 **11 Claims**



Unitary apparatus for precisely winding wirelike material from a large payoff reel to a takeup spool having an arrangement of operating elements and control circuits to enable a battery of these units to be operated by a single operator. The arrangement of elements permits of a treating means such as cleaning being interposed between the payoff reel and takeup spool.

3,578,795
COP WINDER WITH CONTROLLED YARN TENSION
Gaspare Polese, Padua, Italy, assignor to Utita Officine E Fonderie Di Este S.P.A., Padua, Italy
Continuation-in-part of application Ser. No. 563,440, July 7, 1966, now Patent No. 3,412,949. This application July 12, 1968, Ser. No. 744,429
Int. Cl. B65h *59/38*
U.S. Cl. 242—45 **8 Claims**



A yarn feeler means for a yarn winder includes a dancer pulley carried by a pivotally supported arm pivotal about the axis of a mounting shaft, the dancer pulley being engaged in a loop of the yarn in advance of the yarn-winding means. Spring means are connected to the shaft to apply an essentially uniform torque thereto and tension to the looping arm. The yarn winder is driven from a variable speed motor supplied by a supply circuit including supply adjusting means operable responsive to the actual position of the dancer pulley and arm to provide a supply proportional to the actual position to compensate for differences between the yarn-feeding speed and the yarn-winding speed. An auxiliary supply control circuit is effective, when closed, to boost the adjustment of the supply, and includes a movable contact supported by an arm fixedly connected to the shaft and movable within an arc of small amplitude, the movable contact, upon movement of the dancer pulley and arm in one given direction, engaging a fixed contact to close the auxiliary control circuit to boost the motor supply, such as the motor voltage, to counteract any tendency to increasing the difference between the yarn-feeding and yarn-winding speeds.

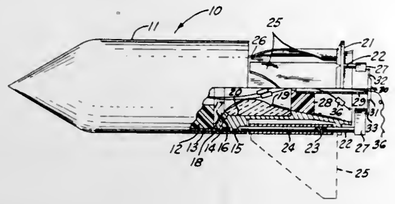
ERRATUM

For Class 243—797 see:
Patent No. 3,579,244

3,578,796
SPINNING AND STABILIZING SYSTEM FOR SOLID PROPELLANT ROCKET OR MISSILES
Travis J. Hagler, Huntsville; William R. Puckett, Trinity, and Bobby G. Tanner, Huntsville, Ala., assignors to Thiokol Chemical Corporation, Bristol, Pa.
Filed Sept. 25, 1968, Ser. No. 762,491
Int. Cl. F42b *13/32*
U.S. Cl. 244—3.23 **3 Claims**

A system for imparting a spin force to a solid propellant rocket while it is in a launch tube, and to stabilize the solid

propellant rocket to discontinue the spin force after it leaves

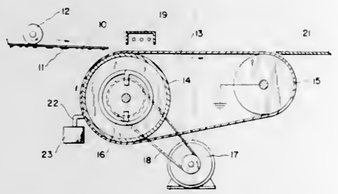


the launch tube.

ERRATUM

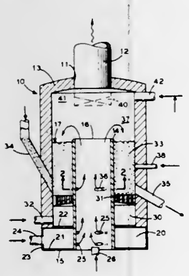
For Class 251—41.9 see:
Patent No. 3,579,270

3,578,797
FUSING METHOD AND APPARATUS
Howard T. Hodges, and Claire F. Hodges, Executrix, Perinton, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Sept. 26, 1969, Ser. No. 861,510
Int. Cl. F27b *9/28*
U.S. Cl. 263—3 **9 Claims**



A toner image is fused to a receiver sheet without substantial heating of the sheet by placing the sheet, image side down, on an endless heat-conductive web extending around at least two spaced rotatable supports. One or more of these rotatable supports may include a heating element to heat the endless web at or adjacent to the point where the receiver sheet is brought into contact therewith. A corona charger may be used to tack the receiver to the endless web to assure positive contact therebetween.

3,578,798
CYCLONIC FLUID BED REACTOR
Walter C. Lapple, and Edward M. Poole, Alliance, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.
Filed May 8, 1969, Ser. No. 823,056
Int. Cl. F27b *15/02*
U.S. Cl. 263—21 **9 Claims**

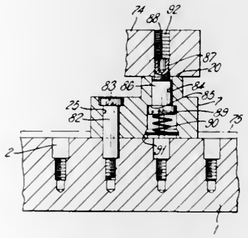


A high capacity fluidized bed unit is formed of single or multiple stages where reaction products may be maintained out of contact with gaseous products of combustion used to provide heat for the reaction.

ERRATUM

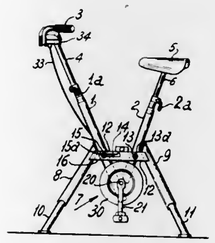
For Class 263—52 see:
Patent No. 3,579,616

3,578,799
DEVICES FOR SECURING OR POSITIONING WORKPIECES FOR MACHINING OPERATIONS
Peter Grant Davis, Deptford, London, England, assignor to The Molins Machine Company Limited, London, England
Filed Apr. 4, 1968, Ser. No. 718,885
Claims priority, application Great Britain, Apr. 14, 1967, 17,248/67
Int. Cl. B23q *3/02;* **F16b** *41/00*
U.S. Cl. 269—51 **3 Claims**



A device for securing a workpiece to a pallet comprises a hollow support element, which can be screwed to the pallet, and which contains a screw urged by a spring to project from a support surface on that side of the support element remote from the pallet. The projecting end of the screw has a hexagonal recess which can receive a key inserted through a hole in the workpiece to rotate the screw and thread it up into the workpiece.

3,578,800
FOLDABLE BICYCLE-TYPE EXERCISING DEVICE
Paolo DiNepi, Via Crocefisso 6, Milan, Italy
Filed Oct. 8, 1968, Ser. No. 765,894
Claims priority, application Italy, Oct. 13, 1967, 815,374
Int. Cl. A63b *21/00, 23/04*
U.S. Cl. 272—73 **7 Claims**



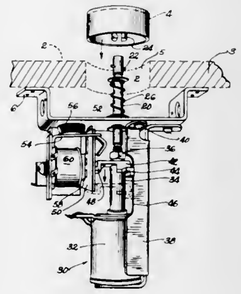
A foldable frame provided with a seat and a handlebar. The lower portion of the frame carries a step-up gear transmission having a pedal-operated drive shaft. The transmission drives a flywheel which is coaxial with the drive shaft and is equipped with a friction brake. A speedometer on the handlebar is operatively connected to the transmission. The foldable frame includes pairs of downwardly convergent frame members and leg members pivotally connected to the frame members, and a pair of transversely spaced straps straddling the frame and leg members. One leg member is rigidly secured to the straps at one end thereof, the other end portions of the straps are provided with longitudinal slots, a

pivot extends through the slots and connects the other leg member and one of the frame members to the straps, and a second pivot connects the other frame member to the straps.

3,578,801
PRACTICE BASEBALL BAT
Raymond Piazza, 15402 Flagstaff St., La Puente, Calif.
Filed Dec. 30, 1968, Ser. No. 787,670
Int. Cl. A63b *59/06, 69/40*
U.S. Cl. 273—26 **4 Claims**

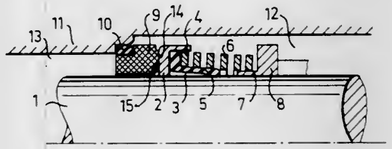
A hollow bat for baseball practice having an internal longitudinal rod and movable weight which will increase the inertia of the bat during the swing.

3,578,802
VERTICALLY ADJUSTABLE BUMPER FOR BALL ROLLING GAMES
Frank T. Murphy, Chicago; Norman R. Clark, Oak Lawn, and William E. Casey, Chicago, Ill., assignors to Williams Electronic Manufacturing Corporation, Chicago, Ill.
Filed Feb. 25, 1969, Ser. No. 802,160
Int. Cl. A63b *71/00*
U.S. Cl. 273—129 **3 Claims**



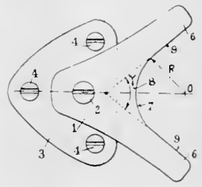
In order to provide for random or controlled variations in ball-rolling games, which include a ballfield and means for causing balls to enter upon the field and engage elements permitting scoring depending upon the skill of the player, this application discloses a bumper which is normally flush with the surface of the field, but which may be moved by that surface in order to impede the passage of balls used in the game. The bumper may be arranged to have its movement controlled in a random fashion or may be arranged to be subject to the ability of a game player to direct the passage of the ball. A solenoid is used to retract the bumper to its flush position in which it is held by a latch which may be released by energizing a coil.

3,578,803
SLIDE-RING SEAL
Dieter Karl Wilhelm Huhn, Lagmansuagen 9, Vallentuna, Sweden
Filed Feb. 13, 1969, Ser. No. 798,869
Claims priority, application Sweden, Feb. 15, 1968, 1,981/68
Int. Cl. F16j *15/34*
U.S. Cl. 277—85 **5 Claims**



A slide-ring seal for rotating shafts seals two spaces separated by a transverse wall. The seal comprises a seal ring rotating with the shaft and a counter-ring in the said wall. A helical spring urges the seal ring towards the counter-ring. An O-ring or sleeve seals the ring against the periphery of the shaft. The cross section of the spring wire is substantially greater in its radial direction than in its axial direction, the spring transmitting to the shaft the entire or a substantial part of the slide friction between the slide surfaces. The spring is of conical shape and exerts both axial and radial forces so as to effect sealing between the sleeve and the periphery of the shaft also.

3,578,804
SAFETY ABUTMENT OF SKI BINDING
Jean Joseph Alfred Beyl, 10, blvd. Victor Hugo, Nevers, France
Filed Dec. 16, 1968, Ser. No. 783,843
Claims priority, application France, Dec. 29, 1967, 134,220
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35T **3 Claims**

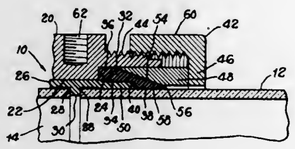


A safety abutment of a front ski safety binding for coacting with the rounded toe end of a ski boot upper instead of with the sole portion thereof, the abutment device being so designed that it can coact with ski boots of different designs and sizes.

3,578,805
TUBE COUPLING
Lloyd K. Dutton, West Paterson, N.J., assignor to Mooney Brothers Corporation, Little Falls, N.J.
Filed Mar. 5, 1969, Ser. No. 804,581
Int. Cl. F16l *9/14*
U.S. Cl. 285—55 **4 Claims**

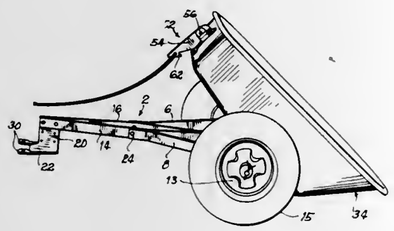
A tube coupling for coupling tubes capable of carrying corrosive fluids, the tube coupling employing an outer body of relatively rigid, high strength material, an inner tubular member of a resiliently deformable, generally inert, corrosion resistant material such as a fluorocarbon resin received within the outer body and having a bore for receiving a tube therein, an annulus of elastomeric material having a first por-

tion placed around the inner tubular member adjacent an end thereof and a second portion extending beyond the end of the inner tubular member, the annulus retaining the inner tubular member within the outer body against inadvertent removal therefrom, a nut threaded onto the outer body and means coupling the nut and the annulus such that upon threading the nut along the outer body the coupling means



will axially contract the annulus to radially contract the inside diameter of the first portion of the annulus and thereby deform the inner tubular member radially inwardly to grip the tube therein and establish a seal between the inner tubular member and the tube therein and to radially contract the inside diameter of the second portion of the annulus and thereby grip the tube therein in response to axial movement of the threaded member.

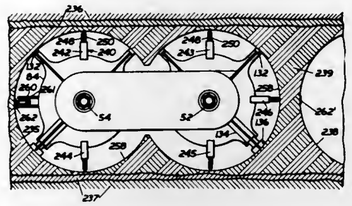
3,578,806
TRAILER AND UNDERCARRIAGE THEREFOR
Roger R. Tonelli, Chicago, Ill., assignor to Radio Steel & Mfg. Co., Chicago, Ill.
Filed Feb. 14, 1969, Ser. No. 799,179
Int. Cl. B60p *1/24*
U.S. Cl. 298—2 **5 Claims**



A trailer having an undercarriage formed from flat strip material which has an adjustable hitch on its front end and carries a self-dumping dump body is provided. A latch on the dump body is engageable with a cooperating member and need not be accurately registered therewith.

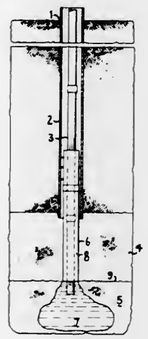
3,578,807
METHOD OF STEERING
Arthur Lee Barrett, 2928 Lothair Way, Michigan City, Ind.
Original application July 11, 1966, Ser. No. 570,109, now Patent No. 3,421,796, which is a continuation-in-part of application Ser. No. 202,642, June 11, 1962, now abandoned , which is a continuation-in-part of application Ser. No. 751,316, June 28, 1958, now abandoned. Divided and this application Nov. 5, 1968, Ser. No. 773,584
Int. Cl. E21c *35/08*
U.S. Cl. 299—1 **10 Claims**

A method of maintaining a desired distance between a steerable earth strata mining means and a laterally adjacent bore. A signal-reflecting means is placed at a known location along the bore. The mining means includes means to emit signals toward the reflecting means and another means to receive a portion of the original signal which is reflected by the reflecting means. The mining means is steered in



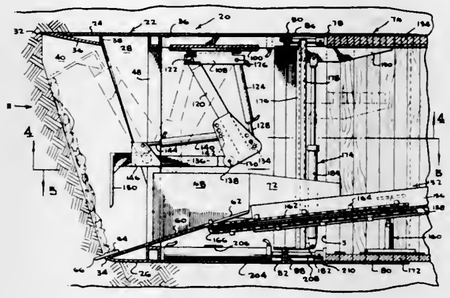
response to the reflected signal received by the receiving means.

3,578,808
SOLUTION MINING METHOD AND APPARATUS
Byron P. Edmonds, and Douglas C. Ruse, Saskatchewan, Canada, assignors to Kolium Chemicals Limited, Regina, Saskatchewan, Canada
Filed Jan. 14, 1969, Ser. No. 790,935
Int. Cl. E21b *43/28*
U.S. Cl. 299—4 **12 Claims**



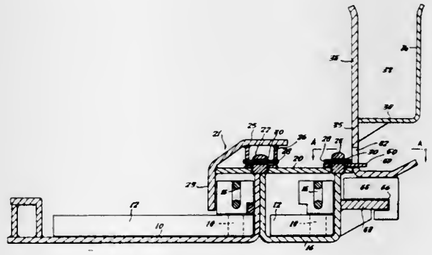
A method of solution mining soluble subterranean deposits is shown in which a bore hole is cased to the depth equivalent to a desired height of a cavity to be developed in a deposit. Into the cased bore hole a tubing string is introduced with a liner rigidly mounted thereon. The tubing is passed through the casing and into the soluble deposit a substantial distance below the end of the casing set in the deposit. A fixed distance is provided between the end of the tubing and the end of the liner attached thereto. Solvent is then introduced into the soluble deposit and cavity development begun by dissolution of the minerals in the deposit with a suitable solvent. When lateral development of the cavity has proceeded to the desired extent, roof raises are made by moving the tubing string in a vertical direction upward from ground level. The fixed liner moves with the tubing string since it is rigidly mounted thereto. Thus, a fixed mining distance is maintained between the influent point for the solvent entering the soluble deposit and the effluent or withdrawal point. Roof raises can be accomplished in this manner as fixed distances until the liner is finally introduced into the casing by the vertical movement of the tubing toward the ground surface. The apparatus involved in conducting the novel method of the invention is also disclosed.

3,578,809
METHOD AND APPARATUS FOR FORMING SUBTERRANEAN STRUCTURES
Vernon Cunningham, P.O. Box 9337 Springhill Station, South Charleston, W. Va.
Filed May 9, 1969, Ser. No. 823,407
Int. Cl. E21d *23/00*
U.S. Cl. 299—33 **4 Claims**



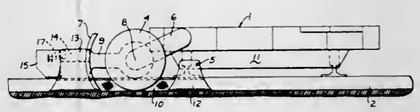
A multisection shield incorporates means for subterranean excavation and for conveyance of excavated materials and provides for the installation of the lining planks within the shield. This apparatus is employed in a system of tunnel or conduit lining wherein floor and roof planks are prepositioned and sidewall planks are wedged in place therebetween.

3,578,810
CABLE HANDLER TROUGHS
Gordon Newstead, Moorside, Durham, England, assignor to R. B. Bolton (Mining Engineers) Limited, Durham, England
Filed July 24, 1969, Ser. No. 844,279
Claims priority, application Great Britain, July 30, 1968, 36316/68
Int. Cl. E21c *35/20*
U.S. Cl. 299—43 **4 Claims**



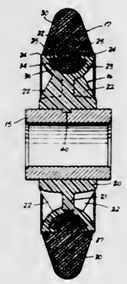
The present invention relates to chain conveyors for conveying bulk material, wherein the conveyor has mounted to it and extending along its length a trough for cables used in the operation of the conveyor. A tongue and an upstanding pin are provided on a fixed portion of the conveyor, and a slot to receive the tongue is provided on the trough. A locking plate extends through an aperture in an upright portion of the trough and over the pin. Shoulders on the plate engage the sides of the portion adjacent the aperture. A split dowel passes through the pin to retain the plate on the pin. The plate holds the trough in position on the tongue, but can be easily removed without disturbing the trough. The invention is particularly applicable to a conveyor used at a mining face, wherein the open-top trough contains power cables for the travelling cutter.

3,578,811
ROLLER CUTTER
Friedrich-Karl Bassier, Eppinghoven/uber, Dinslaken, and Hans Tekathen, Dinslaken Niederrhein, Germany, assignors to Gebr, Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany
Filed Aug. 6, 1969, Ser. No. 847,964
Claims priority, application Germany, Aug. 10, 1968, P 17 58 809.9
Int. Cl. E21c *27/24, 35/20*
U.S. Cl. 299—45 **3 Claims**



A mining machine having a cutting roller supported by a pivotable supporting arm and rotatable about a horizontal axis, in which said cutting roller is equipped with a conveying shield pivotable about the axis of said roller while a ramp is connected to the machine carriage and ascends from the floor of the seam of the rock being mined to the upper edge of the long wall conveying means, both ends of said ramp carrying confining walls curved in conformity with the curvature of the conveying shield and arranged adjacent one edge of said shield, said confining walls in either one of two end positions of said conveying shield closing off the space between the conveying shield and the long wall conveying means.

3,578,812
SUPPORT WHEEL AND METHOD OF MAKING SAME
Frederick Taussig, Ladue, and Robert Gene Tanner, St. Charles, Mo., assignors to Arundale Manufacturers, Inc., St. Louis, Mo.
Filed Mar. 3, 1969, Ser. No. 803,853
Int. Cl. B60b *5/02*
U.S. Cl. 301—63 **10 Claims**



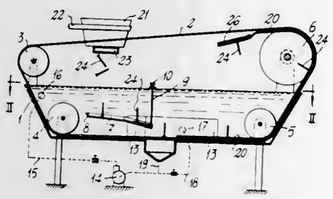
The inventions are a support wheel assembly and a method of making it. The support wheel comprises a central bearing, a circular elastic tire, and a plastic wheel interposed between the bearing and tire. The tire has opposite circular clincher grooves on its sides and locking knobs on its inner wall. The plastic wheel is molded around the bearing, into the grooves, and around the knobs.

The method involves locating the tire, and usually the bearing, as inserts in a mold cavity, the tire being compressed at opposite sides adjacent the rim, causing it to be temporarily reduced in width, and to bulge inward at the clincher grooves. Plastic to form the wheel is injected under pressure through at least three equally spaced gates in the hub portion of the mold cavity. The plastic flows around the bearing insert, if present, then outwardly to form a wheel web, until it strikes an arcuate inner wall of the tire. It is thereby evenly divided to flow outwardly and laterally to form the wheel rim. At the edge of the rim it is deflected laterally into the clincher grooves of the precompressed tire to form a circular clincher bead therein, and also around the edge of the rim to

form a peripheral outer ridge. It flows around the knobs, or similar projections, on the inner wall of the tire and interlocks therewith.

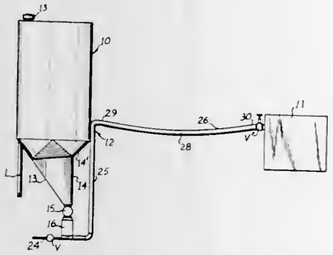
The inward compression of the walls of the tire aids in preventing flow of the plastic up the sides of the tire, and, if the mold is designed in a manner herein disclosed, permits the formation of the ridges around the wheel rim adjacent the sides of the tire. A two-piece core and cavity mold is employed, the separations being located at the maximum outward extremes of the wheel, to vent air from the mold. Upon removal from the mold, the tire is snug on the wheel, and the wheel is shrunk or bonded to the bearing, if present.

3,578,813
DEVICE FOR IMPARTING A PRE-ARRANGED ARRAY TO AND CARRYING AN ORDERLY TRAIN OF ELONGATED BODIES, THE BARYCENTRE OF WHICH BEING ADJACENT AND END THEREOF
Tomaso Ruscitti, Via Amedeo D'Aosta, 11, Milan, Italy
Filed July 17, 1968, Ser. No. 745,527
Claims priority, application Italy, Aug. 5, 1967, 19277/67
Int. Cl. B65g *53/30*
U.S. Cl. 302—14 **6 Claims**



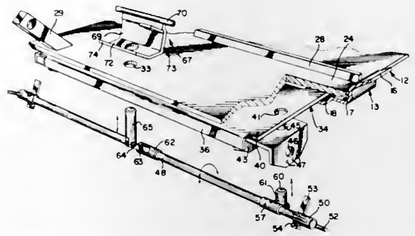
Device for imparting a vertical array and conveying along guide means drawing tubes applied on valves to be attached on aerosol containers, the device comprising a container from which the tubes are caused to randomly drop on a moving belt provided with perforated housings or slots. Prior to dropping on the belt, the tubes orientate in a vertical direction due to friction encountered with the fluid in which they move and, once having dropped into the belt housing or slot, they are retained therein due to suction exerted below the belt and then conveyed to collecting guides.

3,578,814
METHOD AND APPARATUS FOR CONVEYING DUST
Percy E. Todd, Apison, Tenn., assignor to Percy Todd Manufacturing Company, Cleveland, Tenn.
Filed Sept. 3, 1968, Ser. No. 756,820
Int. Cl. B65g *53/40*
U.S. Cl. 302—40 **5 Claims**



A method and apparatus for conveying particulate material from a silo to a container in which material is transferred to a surge container that is substantially at atmospheric pressure, pressurized fluid is then directed into the surge container to entrain the particulate material and convey it along the path, the path having a trap to assure that the particulate material is conveyed by the fluid.

3,578,815
MATERIAL DISCHARGE ARRANGEMENT FOR HOPPER STRUCTURES
William D. Mundinger, Highland, Ernest J. Nagy, Munster, Ind., assignor to Pullman, Incorporated, Chicago, Ill.
Filed Sept. 30, 1968, Ser. No. 763,745
Int. Cl. B65g *53/40*
U.S. Cl. 302—52 **14 Claims**



A discharge arrangement for hopper structures including a sliding gravity gate which is movable to open and closed positions relative to the hopper structure with the gate being movable by a manually operable mechanism. A pneumatic discharge pan is positioned beneath the gate and may be selectively interconnected by an indexing arrangement with the gate to move therewith to the open and closed positions. The manually selectable indexing arrangement by movement of a single rotating shaft is adapted to connect the discharge pan to the gate for movement therewith, to lock the pan in position underneath the discharge opening of a hopper with the gate moved to an out-of-the-way position, and to lock both the gate and the discharge pan in a closed position.

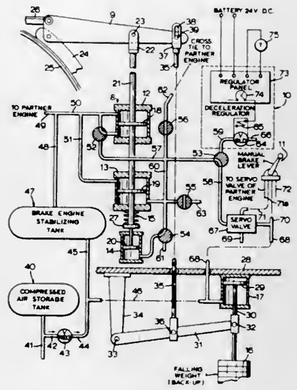
3,578,816
METHOD OF FACILITATING THE RESUSPENSION OF THE SOLID PHASE OF A SLURRY IN A SHUTDOWN PIPELINE
Junn-Ling Chao, Houston, Tex., assignor to Shell Oil Company, New York, N.Y.
Filed Feb. 26, 1969, Ser. No. 802,615
Int. Cl. B65g *53/04*
U.S. Cl. 302—66 **3 Claims**

Method for facilitating the resuspension of settled solids in a shutdown slurry pipeline. As flow in the pipeline is terminated a bladder or bag in the line is inflated in those locations where plug formation by slumping slurry solids is likely to occur. In this manner the settling solids will only occupy the space in the line not occupied by the bladder. Upon restart, the bladder is deflated to allow lateral movement of the solids in the line, thereby facilitating resuspension thereof.

3,578,817
CONTROL OF MINE HOIST BRAKING
Peter De Hertel Eastcott, Peterborough, Ontario, Canada, assignor to Canadian General Electric Company Limited, Toronto, Ontario, Canada
Filed Sept. 19, 1969, Ser. No. 859,272
Claims priority, application Canada, Oct. 26, 1968, 33617
Int. Cl. B60t *7/12*
U.S. Cl. 303—16 **4 Claims**

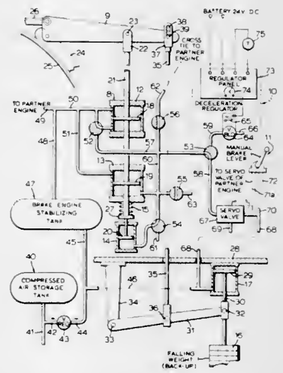
The safety controller for a mine hoist usually incorporates some means for giving a warning of an impending emergency stop when the speed of the hoist exceeds the speed called for by the operating program. Instead of an abrupt emergency

stop, this invention enables the hoist to make an emergency stop at a controlled rate of slowdown giving about the same smoothness as obtained during normal operation. According to the invention, a brake deceleration regulator, which exercises no control over the hoist while it obeys the program, is placed in control of braking by the warning means on the safety controller when the speed of the hoist exceeds the speed called for by the program by the amount necessary to



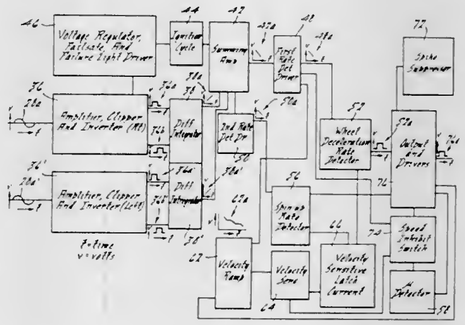
activate the warning means. The deceleration regulator then brings the hoist to a smooth stop at a fully controlled rate. Since the warning means becomes active at a speed somewhat lower than the speed necessary to bring on a full emergency stop, unregulated emergency stopping will seldom if ever occur. In practice, the deceleration regulator introduces another level of safety into the braking system, a level which produces a smooth stop and reserves the emergency stop for the most extreme conditions conceivable.

3,578,818
PNEUMATIC ENGINE FOR MINE HOIST BRAKING
Peter De Hertel Eastcott, Peterborough, Ontario, Canada, assignor to Canadian General Electric Company Limited, Toronto, Ontario, Canada
Filed Sept. 19, 1969, Ser. No. 859,345
Int. Cl. B60x *7/12*
U.S. Cl. 303—16 **13 Claims**



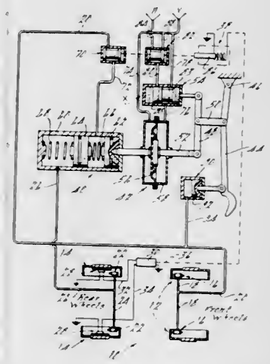
Instead of using a single large pneumatic actuator for driving the brake shoes against the rotating brake surface, this invention uses a number of smaller pneumatic actuators, controlled individually and collectively by means of a regulator, for driving the shoes against the braking surfaces. The actuators are coupled with the brake shoes and the pneumatic fluid is controlled by the regulator such that one actuator normally applies the brakes for a medium or light braking effort and it is assisted by one or more of the other actuators when the braking effort required is greater than the one can deliver. In some instances, it may be desirable to construct the actuator as a single multistage unit wherein one stage is in command of the braking and is assisted by the others whenever necessary. The braking equipment also includes the well-known falling weight for emergency application of the brakes in the event of loss of the pneumatic fluid; otherwise the weight plays no part in the braking operation.

3,578,819
SKID CONTROL SYSTEM
Thomas M. Atkins, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Sept. 23, 1968, Ser. No. 761,709
Int. Cl. B60t *8/08*
U.S. Cl. 303—21 **31 Claims**



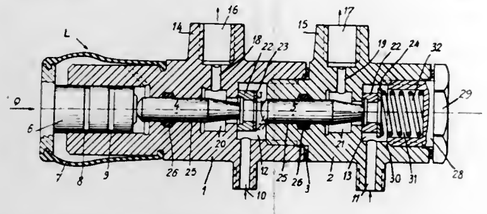
A skid control system for fluid-actuated brakes of a wheeled vehicle including a modulating valve for modulating the fluid pressure to the fluid-actuated brakes and a control circuit for controlling the valve in response to indications of wheel speed and/or wheel deceleration.

3,578,820
TWO-WHEEL SKID CONTROL BY MODULATION OF BRAKE POWER BOOSTER
Hugh E. Riordan, Ann Arbor, Mich., assignor to Kelsey-Haynes Company, Romulus, Mich.
Filed Aug. 18, 1969, Ser. No. 850,933
Int. Cl. B60t *8/12, 13/10*
U.S. Cl. 303—21 **8 Claims**



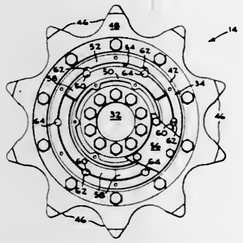
A skid control system for a vehicle having front and rear wheels in which the brakes of the rear wheels are to be skid controlled and with a system utilizing a power booster, this system including means for locking in the pressure to the front brakes upon the occurrence of a skid control signal, at which time the power booster is relieved whereby the pressure to the rear brakes is relieved.

3,578,821
BRAKE LIMITERS
Michel Guettier, Billancourt, France, assignor to Regie Nationale Des Usines Renault, Billancourt (Hauts de Seine), France and Automobiles Peugot, Paris, France
Filed Mar. 14, 1969, Ser. No. 807,369
Claims priority, application France, Mar. 27, 1968, 145,645
Int. Cl. B60t *15/00, 8/18*
U.S. Cl. 303—22 **1 Claim**



The braking effort-limiting device comprises two closely interfitting valve bodies each enclosing a valve and a single control member engaging directly the valve of one body, said valve being adapted in turn to drive directly the valve of the second body responsive to the action of an antagonistic spring.

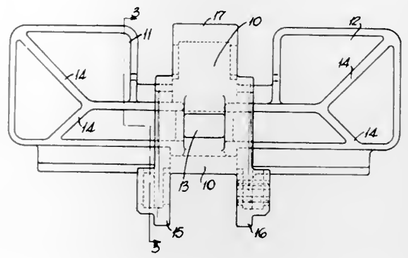
3,578,822
DYNAMICALLY BALANCED POWER TRANSMISSION
Arthur J. Slemmons, Los Gatos, Calif., assignor to FMC Corporation, San Jose, Calif.
Filed Aug. 12, 1969, Ser. No. 849,404
Int. Cl. B62d *55/08*
U.S. Cl. 305—24 **11 Claims**



A rotating power transmission member engaged with a segmented power transmission means is balanced to counteract vibratory torques and forces by three tuned pendulum balance weights spaced 120° apart. A specific application is to a crawler vehicle with tuned pendulums in the track drive, bogey and idler wheel assemblies to balance and counteract vibratory forces and torques transmitted to the wheels by the track. The balance weights are built into each wheel assembly and are tuned to the same order as the number of teeth on the track drive wheel so that the balance weights produce counterforces and countertorques, per revolution, equal to those from the number of track segments, per revolution, causing the imbalance forces and torques. In the case of the idler and bogey wheels, the tuning order is the effective pitch circumference divided by the track pitch.

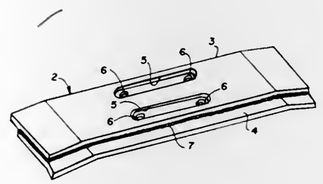
3,578,823
LINKS FOR THE ENDLESS TRACKS OF TRACK-LAYING VEHICLES
Frank Clymer, Lichfield, England, assignor to Lloyds (Burton) Limited, Burton-on-Trent, England
Filed Nov. 21, 1968, Ser. No. 777,754
Claims priority, application Great Britain, Nov. 28, 1967, 54,107/67
Int. Cl. B62d *55/20*
U.S. Cl. 305—42 **2 Claims**

A track link having at each end at least one bush which is formed of elastomeric material and which is located in a recess formed in the link, the exterior of the bush being of noncircular configuration in cross section whilst the interior of the bush is provided with a sleevelike insert which is formed of rigid material, the interior of said insert being of noncircular configuration in cross section and being adapted



to receive in use a pin of corresponding cross section which will extend through the bush or bushes at the end of one link and an aligned bush or aligned bushes at the adjacent end of an adjacent link.

3,578,824
ENDLESS TRACK TREAD
Earl R. Woodward, Jr., Mars, Pa., assignor to Woodward, Inc., Mars, Pa.
Filed Mar. 24, 1969, Ser. No. 809,587
Int. Cl. B62d *55/26*
U.S. Cl. 305—54 **2 Claims**

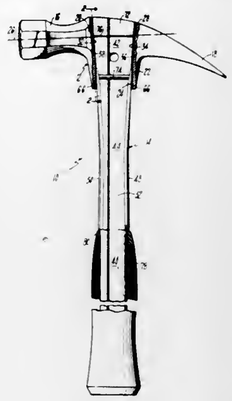


An endless track tread involving the use of two pieces of plate which are welded together in offset relationship at both ends and drilled, or the use of a unitary section of plate of similar offset outline, for use as one of the plurality of overlapping and nesting treads of a self-propelled tractor vehicle.

3,578,825
HAND TOOL
George W. Merrow, Bloomfield, and Robert F. West, Simsbury, Conn., assignors to The Stanley Works, New Britain, Conn.
Filed June 26, 1968, Ser. No. 740,178
Int. Cl. B25g *3/10*
U.S. Cl. 306—32 **12 Claims**

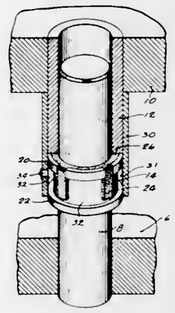
A hammer is provided with a glass fiber reinforced handle having a tenon-shaped end portion in pressuretight engagement with the eye of the hammer head. The handle, which is securely connected to the hammer head without the necessity for separate wedging members or materials, is spaced from the head at the inner end of the eye while being in intimate surface contact therewith along the plane of percussion for a distance of approximately two-thirds the axial length of the eye. The shank and grip portions of the glass fiber reinforced handle are dimensioned to permit mounting of the handle by

passing the shank and handle portions through the eye. Additionally, the handle is self-aligning within the eye by means of



a pair of opposed handle aligning ribs which also serve to confine an auxiliary bonding material.

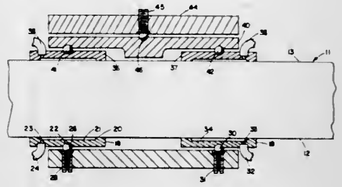
3,578,826
OILER BUSHING
Kasimir Janiszewski, 5426 W. Andover Road, Milwaukee, Wis.
Filed Sept. 23, 1969, Ser. No. 860,370
Int. Cl. F16c *17/00, 33/10*
U.S. Cl. 308—4 **9 Claims**



A conventional bushing has an oiler extension of very slightly increased interior diameter attached to it by a sleeve having pressed-fit connection externally with the bushing and extension. The oiler section is spool shaped, providing an oil-retaining well between it and the sleeve, and it has a shoulder proximate the bushing to seat an annular wick which has extensions downwardly into the well. Both the bushing and this extension are hardened and the bushing provides an extremely tight fit upon the leader pin, the pin being guided by the extension in entering the bushing.

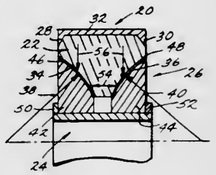
3,578,827
ARRANGEMENT FOR PROVIDING PRECISE MOVEMENT
Joseph E. Smith, Torrance, Calif., assignor to Excellon Industries, Torrance, Calif.
Filed Feb. 19, 1969, Ser. No. 800,488
Int. Cl. F16c *17/00*
U.S. Cl. 308—5 **19 Claims**

This arrangement for providing precision motion includes two relatively movable members, one of which is provided with a surface accurately defining a predetermined path, opposite which is a surface approximately parallel to the first, but not made to the same close tolerances so that some deviations exist. Air bearings are held adjacent these surfaces with ball-and-socket mountings to allow universal movement



of the bearings. The bearings adjacent the irregular surface are held by a resilient means, which allows them to move when inaccuracies are encountered.

3,578,828
SPLIT-RACE BEARING CONSTRUCTION
Stanley S. Orkin, Rockville, Conn., and Richard W. Hartswick, Granby, Conn., assignors to Kaman Aerospace Corporation, Bloomfield, Conn.
Filed Feb. 18, 1969, Ser. No. 800,143
Int. Cl. F16c *17/10*
U.S. Cl. 308—37 **20 Claims**

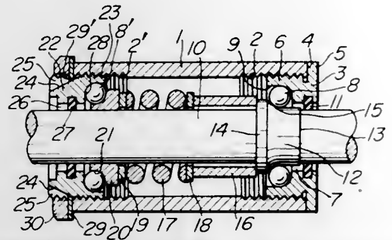


A dry, self-lubricating bearing comprises an outer and an inner race with coengaging bearing surfaces with the bearing surfaces on one race being made of a solid lubricant material and the bearing surfaces on the other race being made of a hardened material such as a thin ceramic coating on a metal substrate. In one embodiment, the outer race comprises a single member while the inner race comprises two separate members slidably carried within opposed seats of the outer race with the bearing being capable of absorbing radial, axial and moment loading individually or in combination. In other embodiment, the outer race is split comprising two members and/or the outer race is carried within concave seats of the inner race.

3,578,829
BOTTOM BRACKET FOR BICYCLE
Kotaro Hata, Nara-shi, and Toshikazu Fujii, Yao-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Nov. 21, 1969, Ser. No. 878,796
Claims priority, application Japan, Nov. 26, 1968, Apr. 1, 1969, 43/86784; 44/26382
Int. Cl. F16c *3/06*
U.S. Cl. 308—179.5 **7 Claims**

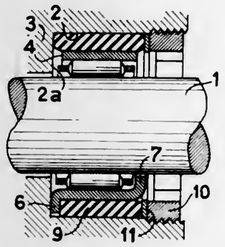
A bottom bracket for bicycle having a pair of ball bearings for supporting a crankshaft, at least one of the bearings having an inner race slidable with respect to the crankshaft, and a coil spring urging the inner race of said one bearing against

the steel balls to avoid chattering of the elements due to localized or irregular wear which would otherwise be produced



on these members thereby to facilitate smooth rotation of the crankshaft.

3,578,830
NEEDLE BEARINGS
Alfred Pitner, Paris, France, assignor to Rueil Nadella, Malmaison, France, fractional part interest
Filed Aug. 26, 1969, Ser. No. 853,075
Claims priority, application France, Aug. 30, 1968, 164,658
Int. Cl. F16c *35/06*
U.S. Cl. 308—207 **9 Claims**

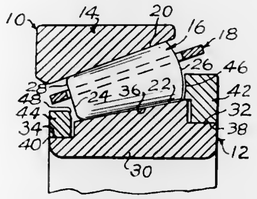


A needle bearing in which the space for circulation of the needles between the two races is reduced in a plurality of angularly spaced zones around the bearing. To this end the ring forming one of the races is radially deformed in one direction in the region of each of the zones and is supported by an auxiliary resilient member, either the ring or the auxiliary member or both having a variable peripheral profile so that when subjected to axial compression, radial deformation is obtained both of the auxiliary member and the ring in accordance with the peripheral variations to thereby give raised appearance in the zones around the bearing. Furthermore the axial compression of the auxiliary member is adjustable during manufacture to produce a desired radial deformation and this axial compression is subjected into the bearing to maintain this radial deformation permanently during the life of the bearing.

3,578,831
COMPOSITE TAPERED ROLLER BEARING AND METHOD OF MAKING THE SAME
Hudson B. Scheifele, 30165 Ponds View Road, Franklin, Mich. 48025
Division of Ser. No. 685,525, Nov. 24, 1967, abandoned, filed Feb. 13, 1969, Ser. No. 798,931
Int. Cl. F16c *33/34*
U.S. Cl. 308—214 **3 Claims**

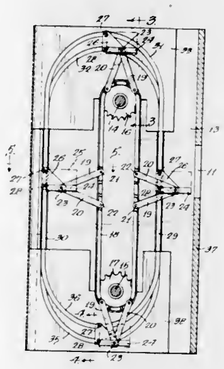
This composite tapered roller bearing has outer and inner races, each of which is built up by a method which includes forming annular inner and outer tapered or frustoconical load-bearing roller path members formed from unheat-treated butt-welded strips of steel, subsequently heat-treating and final grinding these annular members, welding to the large end of the annular inner roller path member a finished side ring, forming an annular roller retainer with circumferentially spaced pocket openings, assembling a complement of tapered rollers in these circumferentially spaced pocket openings of this annular roller retainer, these tapered rollers having spherical surfaces on their larger diameter ends, placing the thus-formed assembly on the thus partially built-up inner race, and welding a smaller side ring to the other end of the annular inner roller path member.

These tapered rollers engage a tapered or frustoconical annular inner load-bearing surface on the annular central roller path member of this composite tapered roller bearing inner race, the larger diameter side ring of which has an annular



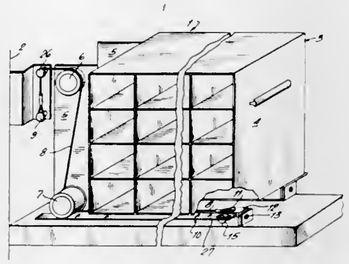
inner surface of spherical curvature mating with the spherically curved surfaces on the larger ends of the tapered rollers. Before welding, the inner roller path member and the side rings are preferably case hardened in the areas actually engaged by the side and end surfaces respectively of the rollers, the remaining area of each ring not so engaged being selectively excluded from the case hardening. This enables the bearing components to be case hardened and precision ground and honed before assembling and welding, preferably by electronic or laser welding to precisely localize the welds.

3,578,832
STABILIZED ELEVATOR FILING DEVICE
Lloyd M. Toms, Crozet, Va., assignor to Acme Visible Records, Inc., Crozet, Va.
Filed Apr. 29, 1969, Ser. No. 820,213
Int. Cl. A47b *47/00*
U.S. Cl. 312—268 **2 Claims**



Stabilizer means for a vertically disposed elevator-type filing apparatus comprising a cabinet having a front opening and wherein a plurality of trays disposed therein are adapted to be moved in an elliptical path and presented at said opening for access to said trays on the links of a sprocket chain, comprising closed path elliptical stabilizer means in the form of channel members embracing said sprocket chains and defining spaced vertical components and a pair of double arch components at the top and bottom of said vertical components and merging and communicating with each other and with said vertical components and triangular stabilizers pivoted at one corner to swivel pins carried by support means secured to said trays and carrying rollers at its two remaining corners disposed to slide in and retained by said channel members.

3,578,833
DRAWER SUSPENSION
Philip Frederick, Brooklyn, N.Y., assignor to Supreme Equipment & Systems Corp.
Filed Mar. 14, 1969, Ser. No. 807,291
Int. Cl. A47b *88/00*
U.S. Cl. 312—330 **6 Claims**



A suspension system for a cabinet or the like having at least one drawer comprising upper and lower rollers on each side of the drawer with a cable having both ends affixed to the cabinet (directly or indirectly) threaded in front of the upper roller and in back of the lower roller on each side, each of the cables being under tension, and an adjusting means for each of the cables comprising a block slidable in a direction parallel to the length of the cable, one end of the cable affixed to the block, and a screw means adapted to cause the block to move in its direction of motion and to maintain the block in the position to which it has been moved, whereby the tension on the cable can be adjusted.

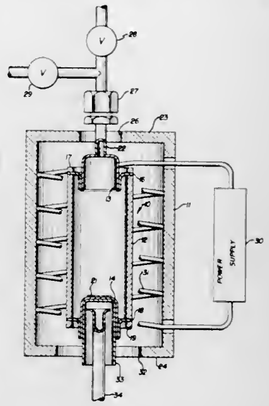
A track in the foregoing device mounted immediately beneath the lower roller and extending in the direction of movement of the drawer and so positioned as to be in support relationship with the lower roller when the tension in the cable is insufficient to support the lower roller and the drawer without assistance.

3,578,834
GENERATION OF ALKALI METALS
Paolo Della Porta, and Elio Rabusin, Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy
Continuation-in-part of application Ser. No. 690,125, Dec. 13, 1967. This application Feb. 12, 1969, Ser. No. 798,785
Claims priority, application Italy, Dec. 15, 1966, and Oct. 12, 1967, 31040/66 and 21538A/67
Int. Cl. H01j *9/38, 7/12*
U.S. Cl. 316—16 **20 Claims**

Compositions of matter which release alkali metal vapors comprising an alkali metal compound and a reducing agent for the compound wherein the reducing agent is an alloy of 5 to 30 weight percent aluminum balance zirconium. These compositions are useful in processes for the release of alkali metal vapors used in the production of photosensitive surfaces in vacuum tubes.

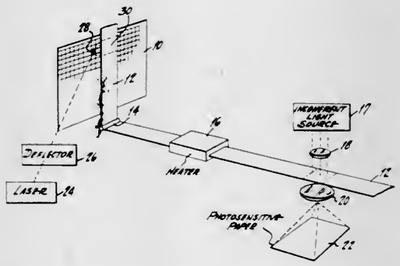
3,578,835
ART OF MAKING VACUUM ENVELOPES
Lowell A. Noble, Hillsborough, and Robert B. Hanley, Campbell, Calif., assignors to Varian Associates
Filed July 28, 1960, Ser. No. 46,026
Int. Cl. H01j *7/18*
U.S. Cl. 316—25 **7 Claims**

1. A bakeout process for a vacuumtight tube containing materials which liberate gases at a given bakeout temperature and a metal which sorbs gases at said bakeout temperature, said process comprising the stops of heating said tube to said bakeout temperature to remove occluded gases, evacuating said tube during said bakeout step, cooling said gas sorbing metal during said bakeout step to maintain the gas sorbing metal at a temperature at which it is substantially ineffective to sorb gases, heating said gas sorbing metal after



said bakeout step, introducing a hydrogen isotope into said tube, and cooling said tube.

3,578,836
RETRIEVAL OF HOLOGRAPHICALLY RECORDED DATA
William J. Hannan, Pennington, N.J., assignor to RCA Corporation
Filed Oct. 16, 1968, Ser. No. 767,991
Int. Cl. G03b *27/10, 27/32*
U.S. Cl. 350—3.5 **3 Claims**

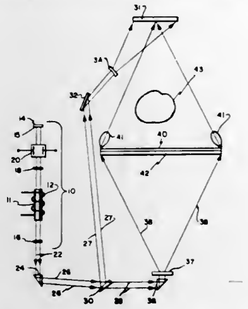


A two-step process for retrieving holographically recorded pages of information. In the first step, a low power laser is employed to reconstruct the image stored in a small hologram and to record this image in a small area of recording medium. In the second step, a high power incoherent light source and optical means are employed to derive from the small image an enlarged hard copy.

3,578,837
DOUBLE-DIFFUSER HOLOGRAPHIC SYSTEM
Robert E. Brooks, Redondo Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Apr. 1, 1969, Ser. No. 811,805
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **6 Claims**

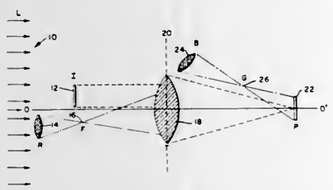
A holographic system for recording holograms of an object in transmission. In order to make more uniform the spatial coherence and the intensity of the light beam of a laser, a light diffuser is disposed in the path of the scene beam. In addition a second light diffuser is also disposed in the path of the diffused and enlarged scene beam. Preferably the second diffuser has a certain directivity which may be achieved by coating the diffusing surface with a transparent lacquer. In order to further improve the directivity of the second diffuser there may be provided a Fresnel lens having one of its focal points in the first diffuser and the other focal point in the recording material for the hologram. The second diffuser

may be replaced by a diffusing and reflecting ellipsoidal section which serves simultaneously the purpose of diffusing the



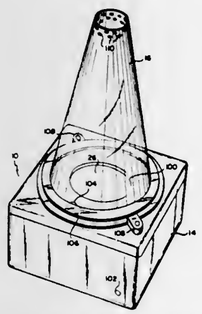
scene beam and directing it from the first diffuser to the recording material.

3,578,838
MULTIPLE HOLOGRAM RECORDING AND READ OUT SYSTEM
James N. Hallock, Watertown, Mass.
Filed Aug. 28, 1969, Ser. No. 853,856
Int. Cl. G02b *27/22*
U.S. Cl. 350—3.5 **4 Claims**



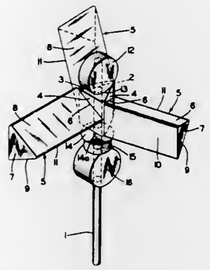
An information recording and readout system is presented wherein multiple holograms are recorded in a single hologram recording medium by the use of three intersecting light beams and a lens system. Hologram patterns are formed by adding a third intersecting light beam to the two intersecting light beams normally used in hologram formation. The location of the third beam is changed for each different hologram to be formed on the medium. Readout, for the case of pattern identification, is accomplished by presenting patterns to the holographic medium and recreating and sensing the position of the third beam.

3,578,839
AUTOMATED DEVICE FOR PROTECTING LENS SYSTEMS
Grant C. Riggle, Bethesda, and James P. White, Bradbury, Md.
Filed Oct. 24, 1968, Ser. No. 770,344
Int. Cl. G02b
U.S. Cl. 350—61 **8 Claims**



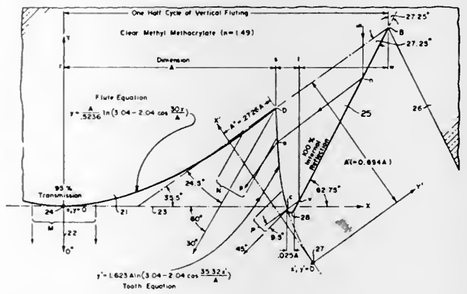
The automated device for protecting lens systems in lasers includes a motor driven protective film which advances across the laser lens after each light flash. A mechanical sensor operative in response to film position selectively connects the film driving motor to an electro-optical control system which energizes the motor in response to light flashes.

3,578,840
REVOLVING REFLECTOR
John O. Richards, 5715 Stumph Road, Parma, Ohio
Filed Jan. 26, 1970, Ser. No. 5,507
Int. Cl. G02b *5/12*
U.S. Cl. 350—99 **4 Claims**



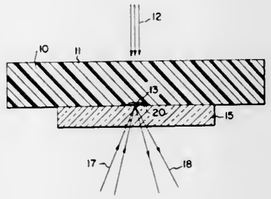
A revolving reflector having three prismatic-shaped blades attached to a bushing through which a central shaft is inserted. The device, due to the position and shape of the prismatic blades, will rotate regardless of the wind direction or its position on a moving object. The various blade surfaces are coated with different reflecting and nonreflecting materials and provide a flashing effect by reflecting light when revolving. The device can be utilized in various ways, as a safety device, on a child's bicycle, or as an indicating marker for a driveway, etc. The revolving reflector is of simple design and can be produced inexpensively, yet is sturdy and durable.

3,578,841
REAR PROJECTION SCREEN
William B. Elmer, 113 Pinckney St., Thornton, N.H. 02114
Filed Dec. 15, 1967, Ser. No. 690,970
Int. Cl. G03b *21/60*
U.S. Cl. 350—127 **11 Claims**



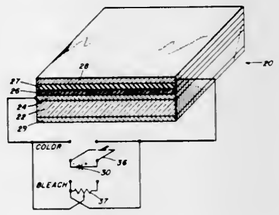
A rear projection screen has a rear surface that provides lens action for collimating incident light rays on essentially the entire screen surface into parallel rays directed essentially perpendicular to the front surface. The front surface is formed with a number of generally parallel closely spaced ribs that diverge incident light rays over a prescribed viewing angle so that anyone within the prescribed viewing angle sees the image projected on the screen with essentially equal brightness. For wide viewing angles the ribs are preferably arranged in clusters so that respective ribs in a cluster direct light rays to respective angular sectors of the viewing region.

3,578,842
EXPLODING MIRROR FOR OPTICAL VIEWING SYSTEM
Richard J. Holland; Zoltan G. Sztankay, Washington, D.C., and Timothy J. Kilduff, Greenbelt, Md., assignors to the United States of America as represented by the Secretary of the Army
Filed Oct. 8, 1968, Ser. No. 766,383
Int. Cl. G02b *5/08*
U.S. Cl. 350—160 **4 Claims**



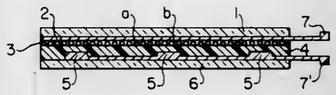
An exploding mirror for an optical viewing system which will partially self-destruct when a laser beam of a minimum predetermined energy density impinges thereon. Using an epoxy encapsulation method, an explosive charge is placed adjacent a thin film mirror on a glass slide. The opposite side of the mirror is part of the optical sight path of the viewing system. A laser beam of sufficient energy density will cause the explosive charge to detonate, thus blowing out a critical section of the mirror and disrupting the optical sight path, thereby protecting the viewer.

3,578,843
CONTROL OF LIGHT REFLECTED FROM A MIRROR
George Augustus Castellion, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Filed Sept. 25, 1968, Ser. No. 773,690
Int. Cl. G02f *1/28*
U.S. Cl. 350—160 **7 Claims**



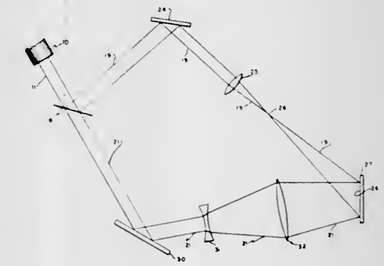
Electro-optical device useful in modulation of reflected light, and the like, typically comprising an electrochromic device and a reflecting layer in sandwiched arrangement, said electrochromic device itself being a sandwich arrangement of a pair of transparent electrodes, and a film of a transition metal compound and an insulating film disposed between the electrodes. The electrochromic device exhibits coloration and bleaching thereof at ambient temperature by control of the polarity of an applied electric field, whereby light reaching the reflecting layer is modulated in intensity, thus modulating, in turn, the reflected light.

3,578,844
RADIATION SENSITIVE DISPLAY DEVICE CONTAINING ENCAPSULATED CHOLESTERIC LIQUID CRYSTALS
Donald Churchill, Kettering, and James V. Cartmell, Dayton, Ohio, assignors to The National Cash Register Company, Dayton, Ohio
Filed Feb. 23, 1968, Ser. No. 707,823
Int. Cl. B01g *13/00;* **H01j** *29/10;* **G02f** *1/34*
U.S. Cl. 350—160 **17 Claims**



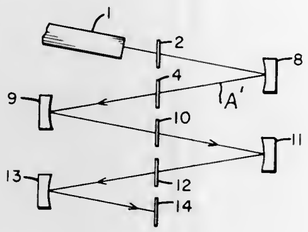
This disclosure is directed to articles of manufacture, chiefly display devices, containing encapsulated cholesteric liquid crystals which change color or shade of color not only upon application of an electric potential but also upon removal of the field. The image produced has a comparable outline to that of the path of the electric field. Three chromatic states are evident, the normal color (before the electric potential is applied), the color given off when the electric field is applied, and the color observed when the electric field is removed. All three chromatic states are readily discernible from one another. The encapsulation of the cholesteric liquid crystal provides an unusual advantage regarding electric field behavior because the third chromatic state (electric potential removed) has a much greater longevity with the encapsulated material versus unencapsulated material of identical composition. Other advantages are also discussed.

3,578,845
HOLOGRAPHIC FOCUSING DIFFRACTION GRATINGS FOR SPECTROSCOPES AND METHOD OF MAKING SAME
Robert E. Brooks, Redondo Beach; Lee O. Heflinger, Torrance, and Ralph F. Wuerker, Palos Verdes, Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed Feb. 12, 1968, Ser. No. 704,884
Int. Cl. G02b *5/18;* **G01j** *3/18*
U.S. Cl. 350—162R **4 Claims**



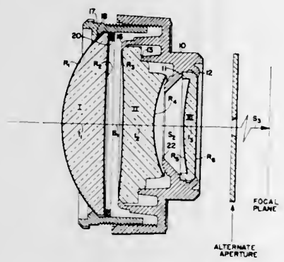
A method making a focusing diffraction grating including casting a diverging beam of coherent light on a photographic plate, casting a convergent beam of coherent light on the same plate so that the beams interfere with each other on the light-sensitive plane of the plate, and then developing the plate. A holographic focusing diffraction grating having a plurality of curved, spaced grating lines on the face of the grating, the lines having specific curves and spacing relating to specific predetermined wavelengths of light for diffracting specific wavelengths of light at predetermined angles. A spectroscope, spectrograph, or spectrometer having a holographic focusing diffraction grating.

3,578,846
MULTIPLE-STAGE OPTICAL INFORMATION PROCESSING SYSTEM
Wu Chen, Royersford, Pa., assignor to Sperry Rand Corporation, New York, N.Y.
Filed Jan. 31, 1969, Ser. No. 795,617
Int. Cl. G02b *27/38*
U.S. Cl. 350—162 **2 Claims**



An optical pattern recognition system is disclosed which has multiple reference-pattern capability and materially decreases the space occupied as compared with the prior art. These advantages flow from the use of a zigzag optical path employing concave mirrors in the system and a novel observation plane which allows cascaded multistage operation. An additional advantage is that the mirrors used may be made of metal or other material and force cooled allowing the use of higher intensity sources.

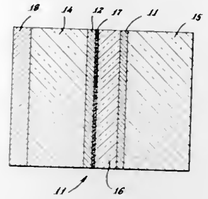
3,578,847
THREE ELEMENT OBJECTIVE LENS
David S. Grey, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Continuation-in-part of application Ser. No. 687,167, Dec. 1, 1967. This application Oct. 3, 1969, Ser. No. 863,562
Int. Cl. G02b *7/04, 9/16*
U.S. Cl. 350—226 **1 Claim**



A telephoto triplet objective lens is disclosed wherein the first element facing the longer conjugate is a positive meniscus lens of relatively high power and thickness. The second element is a negative, biconcave, relatively thick, lens. The third element is a relatively thin biconvex positive lens. Lens elements two and three are made from the same material. This lens is designed to be molded from polymer materials.

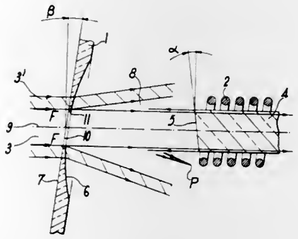
3,578,848
METHOD OF MAKING AN INTERFERENCE FILTER
Robert R. Austin, Ridgefield, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Jan. 26, 1968, Ser. No. 700,928
Int. Cl. G02b/*00*
U.S. Cl. 350—320 **1 Claim**

A Fabry-Perot type interference filter in which the two reflectors are identical high reflection coatings and are separated by a spacer element made of solid glass. The coatings are formed on individual substrates which are optically contacted to the ends of the spacer. The coated ends of the substrates are optically contacted to the spacer element



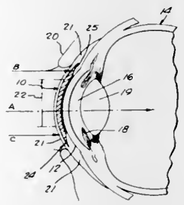
in sequence. After the first substrate is joined to the spacer element, the thickness of the spacer element is adjusted. Once the size of the spacer element is precisely that required, the other substrate is joined to it.

3,578,849
DIAPHRAGM FOR A LASER AMPLIFIER CHAIN
Hubert Guillet, Saint Germain-les-Arpajon, France, assignor to Commissariat A L'Energie Atomique, Paris, France
Filed July 10, 1969, Ser. No. 840,813
Claims priority, application France, July 23, 1968, 160311
Int. Cl. G02b *27/00*
U.S. Cl. 350—321 **1 Claim**



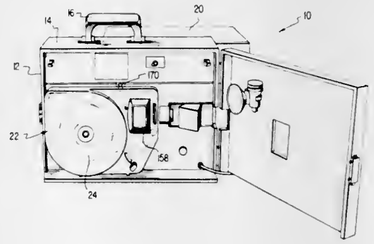
A diaphragm for a laser amplifier chain, comprising an element operable as a transparent divergent lens to an incident laser beam and including an aperture disposed centrally of the lens and of a size to permit a substantially part of a laser beam to pass from a driver laser to a laser amplifier. The element has a planar face on the side of the driver laser and a concave recess surrounding the aperture on its other side.

3,578,850
ANTI-FLARE CONTACT LENS
Alan H. Grant, 3208 Woodhollow Drive, Chevy Chase, Md.
Continuation of application Ser. No. 707,784, Feb. 23, 1968, now abandoned. This application Feb. 11, 1970, Ser. No. 10,592
Int. Cl. G02c *7/04*
U.S. Cl. 351—160 **2 Claims**



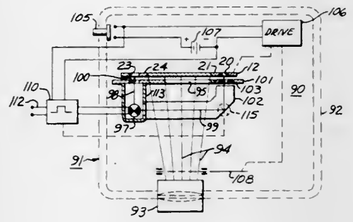
Contact lens, together with process and apparatus for making the contact lens, which has an annular surface area of irregular or waffled conformation for precluding the transmission of light therethrough.

3,578,851
AUTOMATICALLY THREADED FILM APPARATUS INCORPORATING A PROJECTION APPARATUS AND A PRE-THREADED FILM CARTRIDGE ASSEMBLY
Christian Jensen, Oslo, Norway, assignor to MPO Videotronics, Inc., New York, N.Y.
Filed May 24, 1967, Ser. No. 641,039
Int. Cl. G03b *23/02*
U.S. Cl. 352—72 **10 Claims**



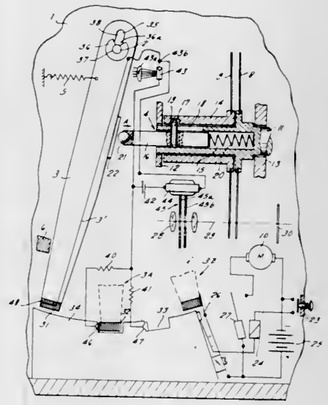
An automatically threaded film apparatus having a projection apparatus and a prethreaded film cartridge assembly intended to be detachably mounted at the projection apparatus. Owing to the synchronous feeding out, running and winding up of the film on the same shaft the film is not exposed to friction, wear and tear. Moreover, mechanism is provided to insure that the film automatically adjusts itself to a desired frame separation between a film gate assembly and a sound head. Simple operation of the unit is insured for by the overall arrangement wherein a common control knob or the like initiates various operations required for reliable visual and/or sound reproduction.

3,578,852
MOTION PICTURE APPARATUS HAVING SENSING MEANS FOR FILM CARRIED CUE SIGNALS
Charles A. Aldridge, Barrington, Ill., assignor to Bell & Howell Company, Chicago, Ill.
Filed June 10, 1968, Ser. No. 735,861
Int. Cl. G03b *21/50*
U.S. Cl. 352—92 **4 Claims**



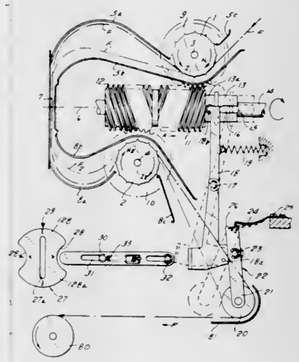
An apparatus for projecting motion picture films has a sensing station located adjacent the path of each margin of the film for sensing control marks on the film. The sensing stations may be selectively actuated to respond to markings on either of the marginal areas or to respond only to the simultaneous occurrence of markings on both marginal areas.

3,578,853
MOTION PICTURE CAMERA
Johann Roth, Schwabhausen; Alfred Roppel, Munich, and Theodor Steibl, Maisach, Germany, assignors to Niezoldi & Kramer GmbH, Munich, Germany
Filed Nov. 26, 1968, Ser. No. 779,051
Int. Cl. G03b *7/14, 21/36*
U.S. Cl. 352—91 **19 Claims**



A motion picture camera with an adjustable rotary shutter and a diaphragm which is adjustable as a function of scene brightness. A lever is pivotable about a fixed axis to adjust the shutter and is movable radially of the axis to adjust the diaphragm independently of scene brightness as a function of the corresponding adjustment of the shutter.

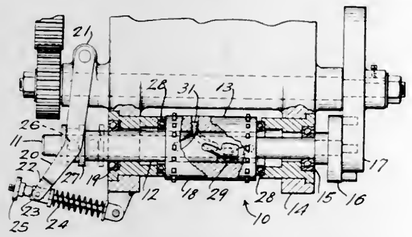
3,578,854
MOTION PICTURE PROJECTOR
Johann Roth, Schwabhausen, Germany, assignor to Niezoldi & Kramer G.m.b.H., Munich, Germany
Filed Oct. 15, 1968, Ser. No. 767,748
Claims priority, application Germany, Oct. 18, 1967, P 15 97 341.8
Int. Cl. B65h *17/42;* **G03b** *1/58*
U.S. Cl. 352—158 **25 Claims**



A motion picture projector wherein the leading end of motion picture film is initially engaged by a first sprocket and thereupon advances along a first fixed loop former, through the film gate and along a second fixed loop former to move into the range of a second sprocket which advances it around

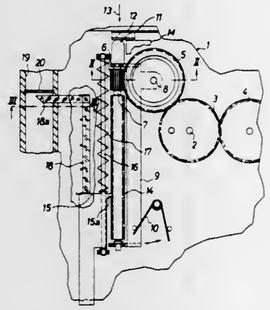
a pivotable deflecting roll and into engagement with the core of a driven takeup reel so that the latter subjects the film to tension. Such tension is utilized to impart to the sprockets additional movements in directions to move the loops of film away from engagement with the loop formers. This is achieved by rotating the first sprocket counter to its normal direction of rotation and by effecting short-lasting additional rotary movement of the second sprocket in its normal direction of rotation. Such movements are superimposed upon normal movements of the sprockets in response to axial movement of two worms each of which drives one of the sprockets by way of a worm wheel, or in response to appropriate displacement of an endless belt which is trained around pulleys rigid with the sprockets.

3,578,855
PROJECTOR FRAME CONTROL
Angelo Boudouris, Sylvania, Ohio, assignor to Eprad Incorporated, Toledo, Ohio
Filed Feb. 20, 1969, Ser. No. 801,010
Int. Cl. G03b *21/46*
U.S. Cl. 352—163 **4 Claims**



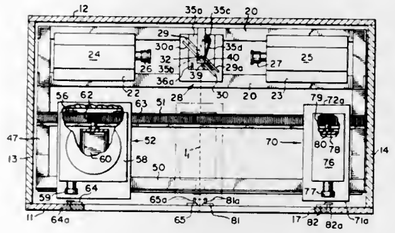
A frame control device for aligning frames on film with a projection lens. A control sleeve is coaxially mounted for limited movement on a driven axle and a film drive sprocket is coaxially mounted on the sleeve for limited movement of the sleeve with respect to the sprocket. Thrust bearings prevent axial movement of the axle and the film sprocket. The sleeve is keyed to the axle and the sprocket such that the phase relationship between the sprocket and the axle may be adjusted by changing the axial position of the sleeve on the axle, thereby aligning the film frame with the lens.

3,578,856
MOTION PICTURE CAMERA WITH FOOTAGE COUNTER
Kurt Thate, Munich; Friedrich Winkler, Unterhaching, and Anton Theer, Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Apr. 30, 1969, Ser. No. 820,491
Claims priority, application Germany, May 18, 1968, A 29 797
Int. Cl. G03b *1/60*
U.S. Cl. 352—172 **13 Claims**



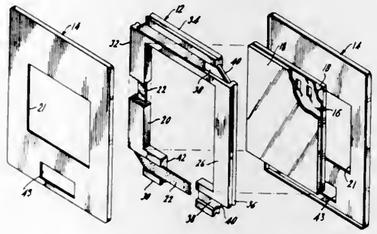
A motion picture camera wherein the film transporting mechanism drives a worm in response to insertion of a film magazine, and the worm moves a pointer with reference to a graduated footage counter scale to indicate the length of exposed and/or unexposed part of the film. The worm is pivoted away from engagement with the pointer in response to removal of the magazine whereby a spring resets the pointer to zero position. The scale transmits light and has an arm which is observable in the view finder. When the pointer moves all the way from starting position, it completely shields the scale from ambient light whereby the operator is informed that the entire film is exposed.

3,578,857
PLURAL UNIT PROJECTION SYSTEM
Edwin Busch, 214 S. Hamilton St., Saginaw, Mich.
Continuation-in-part of application Ser. No. 697,201, Jan. 11, 1968. This application Jan. 27, 1970, Ser. No. 886,420
Int. Cl. G03b *21/26*
U.S. Cl. 353—94 **22 Claims**



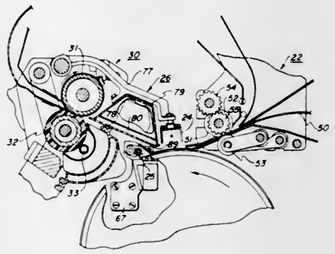
A multiple unit projection system for transmitting images to a remote screen wherein a plurality of projectors selectively project an image on the screen along a common image projecting path. At least a pair of the projectors are individually movable from a remote inoperative position to an image projecting position and apparatus is provided for shifting at least one of the movable projectors from the remote inoperative position to an image projecting position and to simultaneously automatically shift at least one of the other movable projectors to its remote position. Mirror means is provided to transmit the image emanating from one of the projectors to the screen along the image projecting path.

3,578,858
SLIDE MOUNT AND TAPE GUIDE
Wesley A. LeMarr, New York, N.Y., assignor to Montage Production Inc., New York, N.Y.
Filed Jan. 31, 1969, Ser. No. 795,487
Int. Cl. G03b *21/64, 31/04*
U.S. Cl. 353—120 **7 Claims**



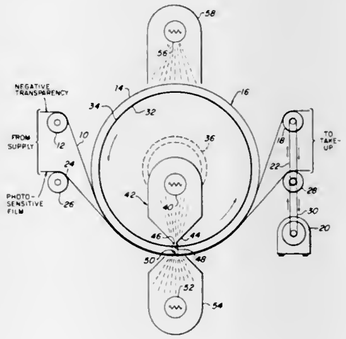
A combined transparency slide mount and magnetic tape guide having conventional means for mounting a visual transparency and having means for guiding a continuous loop of magnetic tape material through four 90° turns around the edges of said mount. The mount is for use in a slide projector which has both projection equipment and a magnetic tape head and tape drive means so that a transparency can be projected and correlated audio information can be played at the same time.

3,578,859
MECHANICAL STRIPPING APPARATUS
William K. Stillings, Penfield, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed July 3, 1969, Ser. No. 838,902
Int. Cl. G03g *15/08*
U.S. Cl. 355—3 **13 Claims**



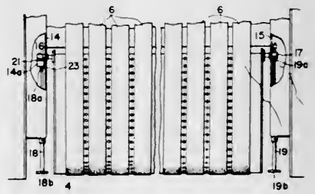
Apparatus to remove an insulating copy sheet from a moving photoconductive surface, the copy sheet being electrostatically tacked to the surface prior to removal by a corona discharge device during a xerographic image transfer operation. A stripping finger is arranged to lift the leading edge of a sheet being advanced on the photoconductive surface and to direct the sheet upwardly away from the surface. A stationary transport having a smooth flat platen to receive a stripped copy sheet in sliding relation therewith is positioned to intercept the leading edge of the stripped sheet and direct the sheet towards a subsequent processing station. Suction ports in the platen located behind the point of contact of the leading edge of the sheet lift the body of the sheet from the stripper finger and hold the sheet in sliding contact with the platen. Lifting means raise the stripper finger away from the moving surface and further stripping of the sheet is accomplished as the sheet slides along the platen and is lifted from the drum surface.

3,578,860
APPARATUS FOR CONTINUOUS DODGING PRINTING
Jacob Louis Breitbord, Framingham, and Richard Donald MacDougall, Arlington, Mass., assignors to Itek Corporation, Lexington, Mass.
Filed Mar. 4, 1968, Ser. No. 710,296
Int. Cl. G03b *27/76*
U.S. Cl. 355—80 **25 Claims**



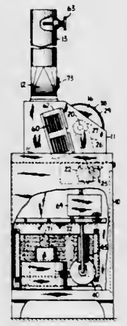
Apparatus is disclosed for continuously dodging a series of photographic reproductions as they are being printed, including an ultraviolet light source for producing a narrow zone of ultraviolet energy to excite a fluorescent surface on the internal wall of a transparent cylinder to emit actinic light, drive means for rotating the cylinder relative to the narrow zone of ultraviolet energy to sweep that zone, which extends transverse to the direction of rotation of the cylinder, along the fluorescent surface to successively excite narrow portions of that surface, and a near infrared light source fixed relative to the ultraviolet light source for directing near infrared light through a transparency onto excited narrow portions of the surface to quench the surface to form a luminous image, unquenched actinic light from the surface being simultaneously directed to a photosensitive medium to expose narrow sections of that medium, and second drive means for moving the transparency and photosensitive medium relative to the narrow zone of energy, for continuously subjecting unexposed sections of the photosensitive medium and companion segments of the transparency to such exposure.

3,578,861
COPY PAPER FEEDING DEVICE FOR USE WITH PHOTOCOPYING MACHINE
Yugoro Kobayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Aug. 27, 1968, Ser. No. 755,564
Claims priority, application Japan, Aug. 31, 1967, 42/74669
Int. Cl. G03b *27/20*
U.S. Cl. 355—91 **3 Claims**



A photocopying machine having an adjustment mechanism for correcting misalignment of the original. Lateral misalignment of the original is corrected by axial movement of a driving belt unit. Longitudinal misalignment of the original is corrected by pivoting movement of the driving belt unit.

3,578,862
PHOTOGRAPHIC EXPOSING APPARATUS
Edward P. Hudock, Santurce, P.R.; Irving G. Russell, and Robert L. Sorensen, Westport, Conn., assignors to Time, Incorporated, New York, N.Y.
Filed Oct. 7, 1968, Ser. No. 765,300
Int. Cl. G03b *27/22*
U.S. Cl. 355—104 **19 Claims**



A photographic exposing apparatus which includes a housing, a light source within the housing and a drum carrying a

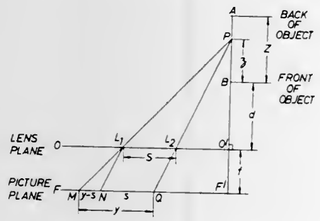
light-sensitive plate and photographic film past the light source to expose the plate through the film.

The plate and film are both registered to the drum and held by suction to the drum while provision is also made for locking the plate to the drum.

The housing contains air deflecting means for directing a flow of cooling air to the region between the light source and the drum and then for exhausting the air to remove any gases or dust from the housing.

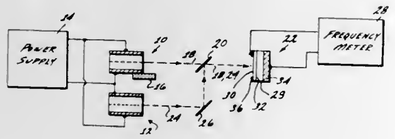
A masking shield is provided between the drum and the light source, and it cooperates with the air deflector means to define air flow passages for directing the cooling air to the region between the drum and the light source.

3,578,863
COMPARATOR DEVICE USING PARALLAX OF TWO PHOTOGRAPHS
Richard George Farrand, 5 Ashbourne Grove, London, England
Filed July 12, 1967, Ser. No. 652,589
Claims priority, application Great Britain, July 15, 1966, 31862/66
Int. Cl. G01c *11/12;* **G01n** *21/00;* **G01h** *11/00*
U.S. Cl. 356—2 **2 Claims**



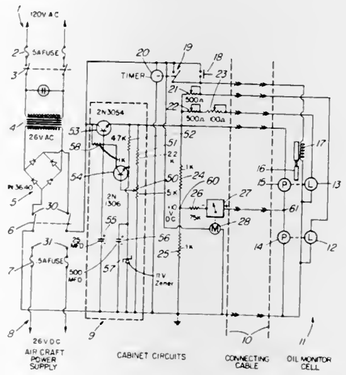
This invention aims at providing a simple means for finding a location in space and for determining the three dimensional coordinates of any object which is shown on a photograph or a pair of photographs. To do this I superimpose one photograph of the object over another photograph of the same object which shows a parallax difference with respect to the first photograph and I then compare the differences in the separations of the vertical centerlines of the photographs with one of the photographs displaced horizontally relatively to the other to superimpose successively a series of pairs of images of the identical points. I also provide an apparatus for making the comparison including a viewing box with a screen and some means of fixing the photograph in relation to the screen and a carriage to move another photograph horizontally across the screen relatively to the first photograph.

3,578,864
SEMICONDUCTOR STRESS TRANSDUCER
Bernd Ross, Arcadia, Calif., assignor to Bell & Howell Company
Filed Sept. 16, 1968, Ser. No. 759,916
Int. Cl. H01s *3/00;* **G01b** *9/02;* **G02b** *27/00*
U.S. Cl. 356—32 **7 Claims**



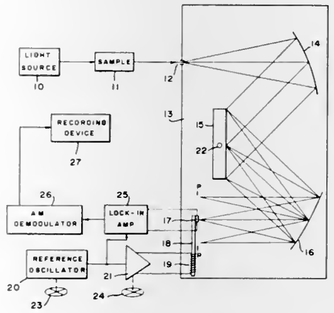
A semiconductor stress transducer in which a coherent light beam from a semiconductor diode laser is photomixed with the light beam from a control semiconductor diode laser. Means are provided for detecting a difference in frequencies of the light beams. The detecting means senses optical heterodyning or homodyning of the photomixed beams and indicates the magnitude of the frequency differential as a measure of stress applied to the transducer.

3,578,865
METHOD AND APPARATUS FOR PHOTOELECTRICALLY MONITORING THE DEGRADATION OF AN OIL STREAM
Alfred E. Traver, Great Neck, N.Y., assignor to Mobil Oil Corporation
Filed Oct. 3, 1968, Ser. No. 764,706
Int. Cl. G01n *1/10, 21/22, 33/28*
U.S. Cl. 356—70 **2 Claims**



A device for monitoring the degradation of an engine oil stream. The device includes a pair of serially connected photocells which form one side of a bridge circuit. One of the photocells senses the amount of light transmission through a diverted portion of the flowing oil stream. The other of the photocells is located in close proximity to the first photocell to compensate for changes in ambient temperature. The amount of light transmission through the diverted portion of the oil stream is indicative of the degradation of the oil and is reflected by unbalancing the bridge circuit. The amount of unbalance of the bridge circuit is either indicated on a meter or recorded.

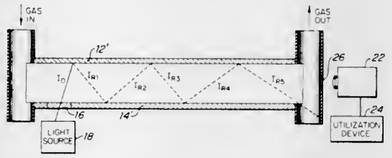
3,578,866
FREQUENCY MODULATED OPTICAL SPECTROMETER
Bryan E. Kohler, Cambridge, Mass., and Alan S. Dubin, Hockessin, Del., assignors to California Institute of Technology, Pasadena, Calif.
Filed May 9, 1969, Ser. No. 823,361
Int. Cl. G01j *3/00, 3/42*
U.S. Cl. 356—74 **11 Claims**



An optical spectrometer is adapted to provide differential wavelength modulation of a spectral signal by vibrating a

photosensitive cell in the focal plane of the spectrograph. A synchronous detector is employed to demodulate the output signal of the photosensitive cell, and thereby provide to a recording device a signal that is the derivative of the spectral signal.

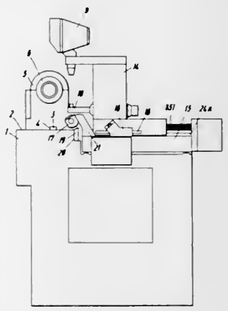
3,578,867
DEVICE FOR MEASURING LIGHT SCATTERING WHEREIN THE MEASURING BEAM IS SUCCESSIVELY REFLECTED BETWEEN A PAIR OF PARALLEL REFLECTORS
Alfred E. Barrington, Lexington, Mass.
Filed Apr. 11, 1969, Ser. No. 815,366
Int. Cl. G01n *21/26*
U.S. Cl. 356—103 **1 Claim**



A method and device is disclosed for determining the gas density within a vacuum chamber by measuring the scattered radiation produced when a gas passes through an apparent single coherent beam of light. The beam is directed onto the first of a pair of highly reflective, parallel surfaces and caused to be successively reflected therebetween, the reflecting surfaces being located within the vacuum chamber.

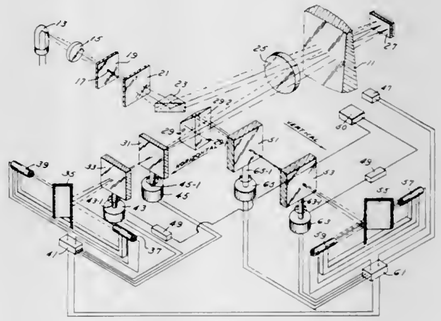
The invention described herein was made by an employee of the United States Government and may be manufactured and used by or for the Government for governmental purposes without the payment of any royalties thereon or therefor.

3,578,868
APPARATUS FOR FACILITATING PRECISION MOUNTING OF TOOLS IN TOOL HOLDERS
Helmut Friedrich Wopkemeier, Dehme, and Werner Richter, Herford, Germany, assignors to Werkzeugmaschinenfabrik Gildemeister & Comp, AKT.-Ges, Bielefeld, Germany
Filed Sept. 12, 1968, Ser. No. 759,387
Claims priority, application Germany, Sept. 15, 1967, P 16 27 041.0
Int. Cl. G01b *9/08;* **B27g** *23/00*
U.S. Cl. 356—165 **10 Claims**



Apparatus for facilitating precision mounting of tools in tool holders prior to insertion of tool holders into spindles, carriages and/or turrets of machine tools comprises a base supporting a rotary spindle for one type of tool holders and having a flat surface adapted to support another type of tool holders. The base is provided with horizontal ways for a first carriage which has ways for a second carriage. The first and second ways are normal to each other and one thereof is parallel to the axis of the spindle and to the plane of the flat surface. Measuring devices are provided on the base and on the two carriages to facilitate movement of carriages to predetermined positions with reference to a holder on the flat surface or with reference to a holder in the spindle. The second carriage is provided with a locating device which enables the operator to install a tool in a predetermined position with reference to a holder in selected positions of the carriages.

3,578,869
METHOD FOR DETECTING AND INDICATING WEDGE IN GLASS
Max J. Irland, Dearborn, and Victor L. Lindberg, Northville, Mich., assignors to Ford Motor Company, Dearborn, Mich.
Continuation-in-part of application Ser. No. 601,437, Dec. 13, 1966, now abandoned. This application Oct. 10, 1969, Ser. No. 865,338
Int. Cl. G01n *21/32*
U.S. Cl. 356—239 **4 Claims**



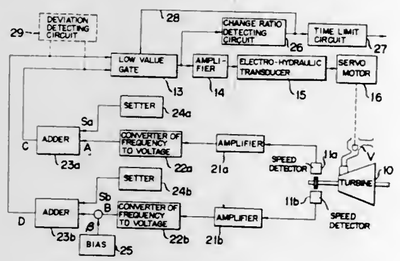
A method of measuring wedge in a glass sheet has the following steps. A beam of parallel light rays is projected through the glass sheet. The beam is reflected through the glass sheet and passes through an adjustable correction device. The correction device controls the direction of further projection of the reflected beam depending on the relative position of the device. The reflected beam is split along an axis into at least two separate beams which, in turn, are projected onto separate light-measuring devices. The light-measuring devices produce a signal corresponding to the intensity of the beams projected thereon. The adjustable correction device is repositioned to a position which causes a prescribed relationship to be established in the signals developed by the light-measuring devices. The position of the correction device indicates the direction and degree of wedge in the glass sheet.

3,578,870
INK WRITING INSTRUMENT
Florindo Viti, Palo Alto, Calif., assignor to Uniline Corporation
Filed Mar. 27, 1969, Ser. No. 810,970
Int. Cl. B43k *8/00*
U.S. Cl. 401—199 **8 Claims**

An improved writing tip is provided for an ink pen particularly adapted for creating solid and relatively wide ink lines wherein an elongate porous ink-conducting nib for transferring ink between an ink cartridge and a writing end face of the nib is coaxially surrounded by an elongate hollow open ended housing with the nib writing face protruding from an end thereof. The nib is formed with a reduced cross section closely adjacent the writing face thereof to form a supplemental ink reservoir bounded by the housing and surrounding the porous nib closely adjacent the writing face for rapid

and efficient transfer of the ink thereto and to provide a swivel mounting for the writing end of the nib for maintaining full face-to-face contact with the surface to be marked, and insuring uniformity of width of the ink line.

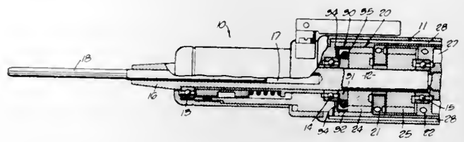
3,578,871
CONTROL DEVICE FOR AN OBJECT SUCH AS A ROTOR IN A PRIME MOVER OR THE LIKE
Tetsuzo Sakamoto, Yokohama-shi, Japan, assignor to Tokyo Shibaura Electric Co. Ltd., Kawasaki-shi, Japan
Filed Feb. 6, 1969, Ser. No. 797,131
Claims priority, application Japan, Feb. 9, 1968, 43/7746
Int. Cl. F01b *25/00;* **H02p** *1/54*
U.S. Cl. 415—10 **14 Claims**



A fail-safe control device for controlling an object such as a rotor of a turbine comprising first and second control systems and a low value gate selecting the output from either of the two control systems which has a safer value. The output of the low value gate is used to control the object, such as the rotor. A change ratio detecting circuit is provided for locking the function of the low value gate when the change ratio of the variable being controlled exceeds a predetermined value.

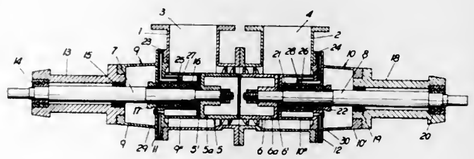
3,578,872
SPEED AND TORQUE CONTROL FOR SURGICAL TURBINE
Thomas W. McBurnie, Santa Barbara, Calif., assignor to Air Instruments, Inc., Santa Barbara, Calif.
Filed Nov. 14, 1969, Ser. No. 876,841
Int. Cl. F01b *25/02*
U.S. Cl. 415—25 **5 Claims**

A turbine-driven rotary tool has a rotary member mounted to turn within a stationary housing, and a rotary torque plate is mounted within the housing. The torque plate has a flange carrying a peripheral rim, and the flange is provided with a series of apertures. An elastomeric ring encircled by the rim acts to close the apertures when the ring is expanded by centrifugal force into contact with the rim, so that maximum



speed of the rotary member is limited by flow of motive fluid around the outside of the rim, and whereby maximum torque is determined by flow of motive fluid through the apertures.

3,578,873
COUNTER-ROTARY PUMPS FOR CHEMICAL LIQUIDS AND PARTICULARLY DYES AND THE LIKE
Guillermo Federico Baez, Jujuy St. 759, Buenos Aires, Argentina
Filed May 26, 1969, Ser. No. 827,789
Claims priority, application Argentina, Nov. 13, 1968, 217,760
Int. Cl. F01d *1/24, 25/18*
U.S. Cl. 415—68 **3 Claims**

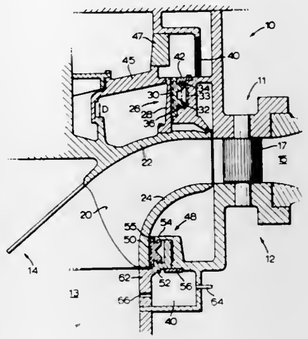


The improvements in counter-rotary pumps for chemical liquids and particularly dyes and the like are characterized in that the blades which are integral parts of their rotors and substantially helicoidal and opposed, include respective flat surfaces which have a constant pitch. The form and placing of these blades constitute the basic means for the reversibility of the pump. Their respective carrier shafts are supported by individual bellmouths being in engagement with a block which, inserted between each bellmouth and each integral portion of the casing of the pump, constitute refrigeration and mounting jackets hydraulically sealing the passage of the said shafts.

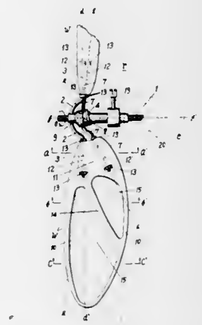
3,578,874
REMOVABLE RUNNER SEAL
Robert Stanley Sproule; Feodor Kanger, Montreal, Quebec, and Hugh Laurie Seybold, Lachine, Quebec, Canada, assignors to Dominion Engineering Works, Limited, Lachine, Quebec, Canada
Filed Aug. 29, 1969, Ser. No. 854,071
Claims priority, application Canada, Sept. 26, 1968, 30,953
Int. Cl. F01d *11/08, 1/20*
U.S. Cl. 415—170 **8 Claims**

A hydraulic turbomachine such as a pump, pump turbine or Francis turbine having a shrouded runner is provided with sheared seals to minimize leakage through the shroud spaces,

and seal access means, to permit servicing of the seals without removal of the runner from its housing, in the form of a service housing adjacent the throat and a crown service housing, permitting disassembly of the seals from within.



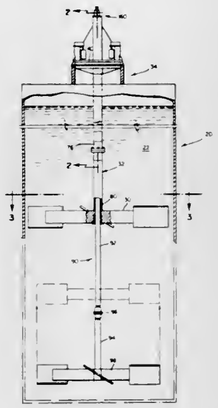
3,578,875
ROTARY WING ASSEMBLY
Yoshiyuki Oguri, 9-7, Minami Aoyama 7-chome, Minato-Ku, Tokyo, Japan
Filed Oct. 24, 1968, Ser. No. 770,162
Claims priority, application Japan, July 9, 1968, 43/47525
Int. Cl. B64c *27/74*
U.S. Cl. 416—109 **3 Claims**



An improved rotary wing assembly is disclosed, in which a tilted bearing body is provided around a principal rotary shaft to which are fixedly secured base end portions of rotary tractive rods, while base portions of rotary following rods are pivotably secured to said tilted bearing body. At the rigid base portion of each wing are drilled two bearing bores extending towards the tip of the wing, and into these respective bearing bores are slidably fitted said rotary tractive rod and rotary following rod respectively. As said principal rotary shaft rotates the angles of attack of the wings are varied to generate lift and an advancing force when the wing moves down.

3,578,876
MIXER
Andrew Stratienko, Philadelphia, Pa., assignor to King of Prussia Research and Development Corporation, King of Prussia, Pa.
Filed June 6, 1969, Ser. No. 831,117
Int. Cl. B01f *7/24*
U.S. Cl. 416—121 **13 Claims**

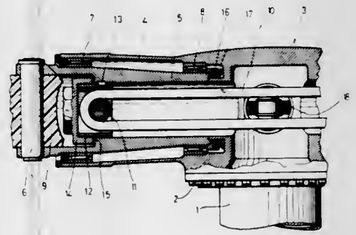
A mixer is provided with a plurality of impellers which are mounted to hang vertically in a tank. The upper impeller is disposed at a fixed vertical depth and the lower impeller is movable vertically. The shaft of the lower impeller extends through the shaft of the upper impeller and is normally coupled thereto to rotate therewith. The shaft of the lower impeller can be uncoupled from that of the upper impeller and



axially supported when both shafts are not rotating. Once uncoupled, the shaft of the upper impeller can again be rotated while the shaft of the lower impeller remains stationary.

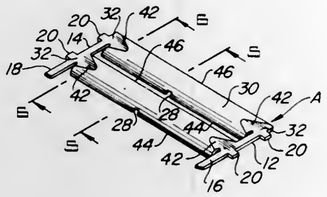
In alternate embodiments, the shaft of the lower impeller can be fixed at a plurality of vertical positions and the power function of the upper impeller can be changed.

3,578,877
ROTOR CONSTRUCTION WITH ELASTIC INTERCONNECTION OF OPPOSITE BLADES
Karlheinz Mautz, Munich, Germany, assignor to Bolkow Gesellschaft mit beschrankter Haftung, Ottobrunn bei Munich, Germany
Filed June 4, 1968, Ser. No. 735,956
Claims priority, application Germany, July 11, 1967, B93415
Int. Cl. B64c *27/48*
U.S. Cl. 416—134 **9 Claims**



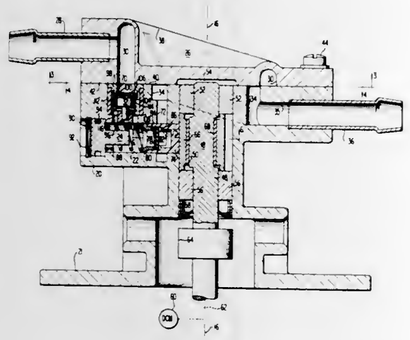
A four blade rotor construction for helicopters includes means for rotatably mounting each blade at equally spaced angular locations around the rotor hub. Diametrically opposed rotor blades are connected with each other by torsion elastic bands or endless members which are stretched across the center of the rotor head with one of the bands being arranged to pass through and intersect the other. The endless bands are formed of laminations of torsion elastic bands and the laminations of one of the bands which connects one pair of blades are arranged in a substantially vertical orientation and the laminations of the other band which interconnects the two adjacent blades are arranged in a substantially horizontal plane. The clearance between the two band loops at the center of the rotor head is such that collective and cyclic pitch controls are possible.

3,578,878
BLOWER WHEEL AND METHOD OF MAKING SAME
Richard V. Ross, Parma Heights, Ohio, assignor to Morrison Products, Inc., Cleveland, Ohio
Filed Aug. 19, 1969, Ser. No. 851,319
Int. Cl. F04d *29/28;* **B21k** *3/04;* **B23p** *15/04*
U.S. Cl. 416—178 **13 Claims**



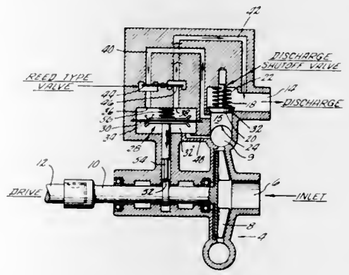
A centrifugal blower wheel is formed from a sheet metal strip having opposite side edges including marginal rim portions extending continuously along the side edges of the strip. The strip has a plurality of longitudinally spaced transverse blades formed therein between the side edges. The blades are connected with the rim portions by integral webs. The blades are formed into an arcuate shape in successive steps. An initial step partially curves the blades and leaves the end portions of the blades adjacent the webs flat. The flat portions are curved in a subsequent step so that the end portions of the blades are work hardened less than if they are successively bent in a plurality of steps. The rim portions are folded between adjacent blades in order to decrease the longitudinal spacing of the blades. The folds are specially formed so that a plurality of bends in each fold are smoothly curved to prevent fracturing of the metal at the bends. The blades have notches formed in their inner edges for receiving the peripheral edges of a pair of discs. The discs have circumferential protuberances adjacent their outer peripheral edges. The protuberances are deformed into contact with one another at their centers to provide each disc with a pair of radially spaced protuberances which are under bending stress and continuously bias the peripheral edges of the discs into firm engagement with the notches.

3,578,879
SPRING ACTUATED FUEL PUMP FOR FUEL INJECTION SYSTEMS
Emile David Long, Elmira, and Kenneth Donald Aumick, Pine City, N.Y., assignors to Gillett Tool Co., Buffalo, N.Y.
Filed Jan. 22, 1969, Ser. No. 793,088
Int. Cl. F04b *23/04, 27/04*
U.S. Cl. 417—62 **19 Claims**



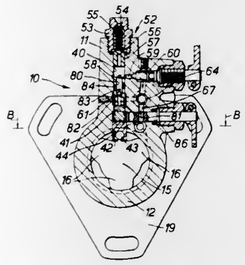
A motor-driven fuel pump for precision fuel-metering systems of the fuel injection type wherein a plurality of radially disposed reciprocating pistons are actuated during the pumping stroke by a pumping spring after the spring has been cocked by means of a motor-driven eccentric motor coupled to the radially disposed pistons. The plurality of pistons can be staged to provide either series or parallel operation by means of a feed manifold which can provide any desired relationship between inlet and outlet connection depending upon the desired output pressure and/or delivery requirements.

3,578,880
DIAPHRAGM OPERATED PRIMING DEVICE FOR CENTRIFUGAL IMPELLER PUMP
John E. Cygnor, Middletown, Conn., assignor to Chandler Evans Inc., West Hartford, Conn.
Filed July 24, 1969, Ser. No. 844,591
Int. Cl. F04d *9/00*
U.S. Cl. 417—203 **5 Claims**



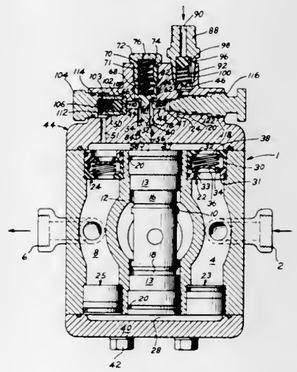
A shaft driven centrifugal impeller pump has a priming arrangement associated with its collector section and drive shaft. A continuously operated diaphragm-type positive displacement pump is operatively connected to a cam mounted on the drive shaft to cause air to flow out of the collector section, into a chamber of the positive displacement pump, out of the chamber and through a conduit connected to the impeller pump's discharge line. A spring loaded shutoff valve prevents a flow from the collector section to the discharge line until the fluid pressure in the collector section forces the valve open. A passage interconnects the chamber of the displacement pump and the collector section to pressure balance the diaphragm.

3,578,881
LIQUID FUEL PUMPING APPARATUS FOR SUPPLYING FUEL TO AN INTERNAL COMBUSTION ENGINE
Dorian Farrar Mowbray, Burnham, and Kenneth Albert Walters Kemp, Ealing, England, assignors to C.A.V. Limited, London, England
Filed Jan. 31, 1969, Ser. No. 796,315
Claims priority, application Great Britain, Feb. 1, 1968, 5138/68
Int. Cl. F04b *23/12, 25/00, 39/10*
U.S. Cl. 417—206 **6 Claims**



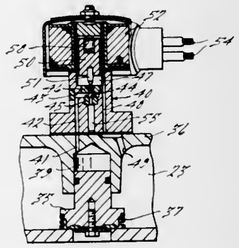
A fuel injection pump having a plurality of pumping plungers mounted in separate bores and actuated by individual cams the plungers being moved inwardly by the lobes of the cams to discharge fuel from the pumping chambers through valve controlled outlets, each bore having a spill opening which at a predetermined position during the inward movement of each plunger, communicates with the pumping chamber to terminate the flow of fuel through the outlet. Each spill opening is closable by a valve for the purpose of providing an excess of fuel and the flow of fuel into each pumping chamber is controlled by a common throttle valve.

3,578,882
INJECTOR
Leonard F. Janssen, Des Moines, Iowa, assignor to Delavan Manufacturing Co.
Filed Sept. 10, 1968, Ser. No. 758,722
Int. Cl. F04b *25/00, 17/00, 23/06*
U.S. Cl. 417—245 **11 Claims**



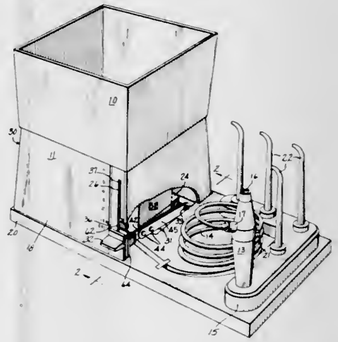
A proportioning injector for injecting a fluid in a positive displacement pump cavity. A passage extends through the injector housing between an inlet for supplying the injection fluid and an outlet for discharging the fluid to the cavity. A chamber is located in the passage and a double-headed piston member having piston surfaces exposed to the chamber and to the pump cavity is located in the chamber to vary the volume of the chamber. The fluid is injected into the pump cavity during the intake cycle of the pump and the chamber is filled with fluid to be injected during the discharge cycle of the pump.

3,578,883
UNLOADER FOR MULTICYLINDER REFRIGERATION COMPRESSORS
Lawrence W. Cheney, Sidney, Ohio, assignor to Copeland Refrigeration Corporation
Filed May 14, 1969, Ser. No. 824,627
Int. Cl. F04b *49/00*
U.S. Cl. 417—286 **3 Claims**



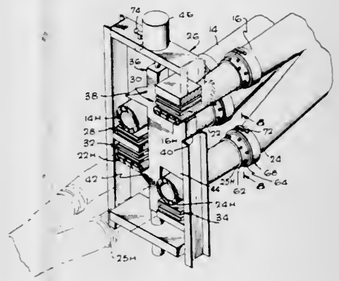
Means are disclosed for controlling the output and reducing the driving load of a multicylinder refrigeration compressor comprising valve means for closing off the inlet to one or more cylinders motivated by the fluid pressure discharge of the compressor and controlled by a solenoid-operated servo valve.

3,578,884
ORAL HYGIENE APPARATUS
Chester F. Jacobson, Scotia, N.Y., assignor to General Electric Company
Filed May 8, 1969, Ser. No. 823,086
Int. Cl. F04d *21/02;* **A61h** *9/00*
U.S. Cl. 417—317 **9 Claims**



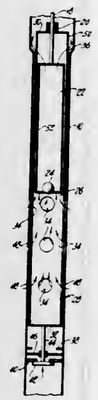
The disclosure herein concerns an improvement for oral hygiene apparatus of the variable pressure pulsed liquid jet type. The oral hygiene apparatus has a single control that regulates the amount of liquid pressure and actuates the motor switch only when the pressure setting is on low, thus permitting the use of a motor that has a lower starting than run torque, such as a shaded pole motor, with a minimum starting torque capacity.

3,578,885
PUMPING APPARATUS
Kelly F. Alton, Malibu, Calif., assignor to James D. Earle, Los Angeles, Calif., fractional part interest
Filed Mar. 5, 1969, Ser. No. 804,512
Int. Cl. F04b *21/00, 43/00, 11/00*
U.S. Cl. 417—454 **7 Claims**



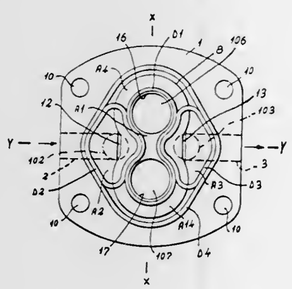
A valve mechanism useful in a pump for pumping concrete comprising a valve member which alternately squeezes closed each of two flexible hoses leading from a hopper which holds concrete to be pumped, and which alternately squeezes closed a pair of flexible hoses leading to two outlets which discharge concrete under pressure. The valve member squeezes the hoses against anvils that are supported on springs, so that a hose is not damaged when a large rock is present therein at the point where the hose is being squeezed.

3,578,886
DOWNHOLE PRODUCING PUMP
Victor J. Nino, Bogota, Colombia, assignor to Texas Petroleum Company, New York, N.Y.
Filed Sept. 11, 1968, Ser. No. 759,177
Int. Cl. F04b *7/00, 34/10, 39/07*
U.S. Cl. 417—495 **7 Claims**



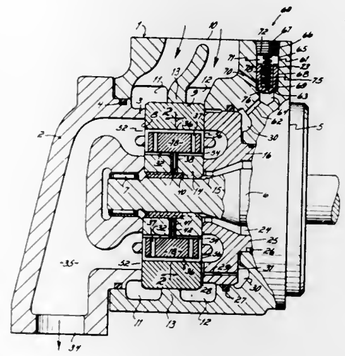
Improved downhole piston pump for production of well fluids involving a multiplicity of quick-acting ports adapted to accelerate handling of heavy or gassy fluids.

3,578,887
GEARED PUMPS
Marco Turolla, 213, Via Toscana, Bologna, Italy
Filed Nov. 12, 1969, Ser. No. 875,710
Claims priority, application Italy, Nov. 15, 1968, 7473A/68
Int. Cl. F04c *5/00;* **F01c** *19/08*
U.S. Cl. 418—132 **7 Claims**



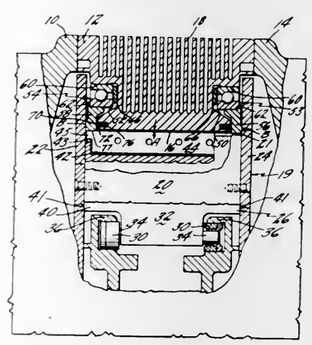
A gear pump has, on the outer face of each bearing plate, four annular symmetrical and symmetrically arranged packings, comprising a central packing which is disposed around the gear wheel pivots and which may be of approximately 8-shaped form, two intermediate packings one on each side of and closely adjacent the central packing, and a peripheral packing encircling both the central packing and the intermediate packing and closely adjacent the latter.

3,578,888
FLUID PUMP HAVING INTERNAL RATE OF PRESSURE GAIN LIMITING DEVICE
Cecil E. Adams, Columbus, Ohio, assignor to Abex Corporation, New York, N.Y.
Filed Apr. 18, 1969, Ser. No. 817,475
Int. Cl. F04c *15/00*
U.S. Cl. 418—133 **34 Claims**



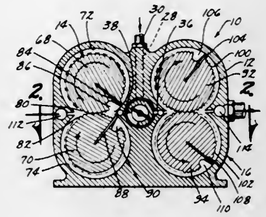
A fluid pressure energy-translating device such as a fluid pump or motor, having a pressure-loaded element, such as a bushing, port plate or cheek plate, held in position in the device by fluid under pressure, which pressure is relieved by a rate of pressure gain control mechanism whenever pressure surges or peaks occur in the pressure loading.

3,578,889
ROTARY ENGINE VANE SEALING MEANS
Louis C. Dagne, Juno; Howard J. McLean, North Palm Beach, and George A. Bonner, Palm Beach Gardens, Fla., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Dec. 23, 1969, Ser. No. 887,472
Int. Cl. F01c *19/02*
U.S. Cl. 418—147 **8 Claims**



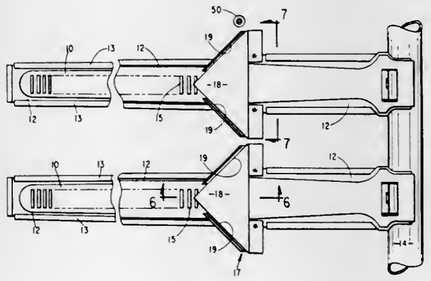
A vaned rotary-type engine having vanes with a main body portion and a telescoping tip seal with separate means being provided to support the main part and support the tip seal so that neither places a radial load on the housing in which the vane rotates. The main portion has cam rollers which ride in cam tracks so that as the vane rotates the radial load is taken through the rollers. The tip seal is supported at each end by two large ball bearing units which are fixed in the housing and have carriers which abut the ends of the tip seal.

3,578,890
ROTARY STEAM ENGINE
Oluf F. Jensen, 929-6th Ave., Council Bluffs, Iowa
Filed Apr. 9, 1970, Ser. No. 26,985
Int. Cl. F01c *11/00;* **F04c** *11/00;* **F04b** *49/00*
U.S. Cl. 418—199 **3 Claims**



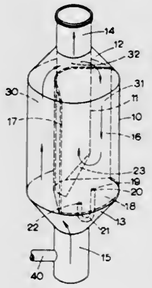
A rotary steam engine comprising a housing including at least first and second power units mounted therein. Each of power units include a pair of cylinders in communication with each other and having two rotors rotatably mounted therein. The rotors have peripheral gear teeth extending therefrom which are in mesh with the gear teeth of the other rotor. A rotary valve is centrally positioned in the housing with respect to the rotors and is adapted to successively supply steam to the power units to cause the rotation of the rotors therein. Each of the rotors have a drive shaft connected thereto which extend outwardly of the housing. A gear is mounted on the outer ends of each of the drive shafts. The gears on the drive shafts of the first power unit are in mesh with each other with the gears on the rotors of the second power unit also being in mesh with each other. The rotary valve has a drive shaft connected thereto which extends outwardly from the housing with a drive gear being secured to the outer end of the drive shaft. The drive gear is in operative engagement with one of the gears of the first power unit and in operative engagement with a gear of the second power unit. Rotation of the rotors causes the rotary valve to be rotated so as to admit and cut off the steam supply to the rotors at the proper times. The rotary valve is provided with a steam discharge opening which has an increasing opening area from one end thereof to the other end thereof to permit the rotary valve to be longitudinally moved with respect to oppositely disposed steam passageways to permit the amount of steam passing therethrough to be varied.

3,578,891
CROSSOVER LIGHTER STRUCTURE FOR GAS BURNERS
Adrian V. Cavestany, Pasadena; Donald R. Smith, Diamond Bar, and Harold R. Bissell, Jr., Hacienda Hts., Calif., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Nov. 28, 1969, Ser. No. 880,602
Int. Cl. F23d *13/02*
U.S. Cl. 431—191 **5 Claims**



The crossover lighting structure is formed with open-ended gas passages extending along opposite sides thereof. The gas passages communicate at their inner ends with a gas discharge passage in the burner, and they diverge therefrom toward the inlet end of the burner. The outer ends of the passages terminate in close adjacency to the outer ends of the passages of the crossover structures mounted on adjacent burners. The passages decrease in cross-sectional area toward their outer ends. The outer wall structure of each passage if formed with an opening of controlled area extending lengthwise thereof. Preferably, the openings increase in width toward the outer ends of the passages.

3,578,892
GASEOUS SEALING DEVICES
Ronald D. Wilkinson, Pinner, Middlesex, England, assignor to Airoil Burner Company (GB) Limited, West Drayton, Middlesex, England
Filed Mar. 12, 1969, Ser. No. 806,584
Claims priority, application Great Britain, Mar. 21, 1968, 13721/68
Int. Cl. F23b *5/00;* **F23c** *9/00*
U.S. Cl. 431—202 **10 Claims**

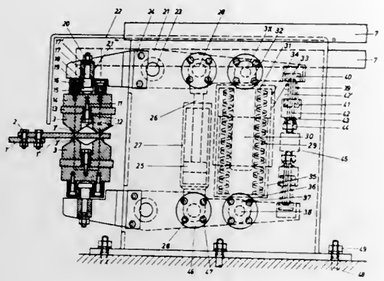


A gaseous sealing device intended particularly for use with flare stacks. The device is composed of two hollow members disposed one within another and a number of walls extending between the members to form first and second chambers communicating with one another, the second chamber communicating with the interior of the innermost member open to the atmosphere. The first chamber receives a waste gas from the flare stack and the gas passes through the first chamber in one direction, through the second chamber in the reverse direction and finally through the innermost member again in said one direction. When the gas flow ceases air is prevented from passing into the first chamber by waste gas trapped in the device.

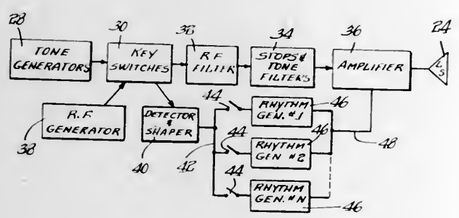
3,578,893
ELECTRICAL COMPONENT CLAMPING DEVICE IN AN ELECTROMELTING INSTALLATION FOR METALS
Otmar Kleinhagauer; Wolfgang Holzgruber; Peter Cerwenka, and Wolfgang Hladny, Kapfenberg, Austria, assignors to Gebr. Bohler & Co. Aktiengesellschaft, Vienna, Austria
Filed Nov. 18, 1968, Ser. No. 776,401
Claims priority, application Austria, Nov. 20, 1967, Nov. 20, 1967, A10398; A10397
Int. Cl. H05b *7/10*
U.S. Cl. 13—16 **4 Claims**

A device for establishing an electrical connection with a component to be used, for example, in the continuous casting of metal. The device includes a pair of electrically conductive clamping members which are adapted to clamp the component between themselves. A pair of swing-lever means are respectively swingable about predetermined axes and carry the clamping members. A fluid-pressure means coacts with

these swing-lever means to act on them in one direction for pressing the clamping members against the component in an opposite direction for retracting the clamping members away from the component.



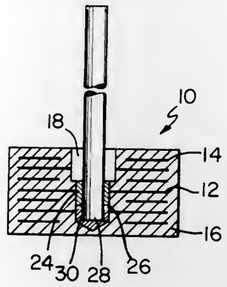
3,578,894
RADIO FREQUENCY KEYING PULSE IN ELECTRONIC ORGAN
Harold O. Schwartz, and Anthony C. Ippolito, North Tonawanda, N.Y., assignors to The Wurlitzer Company, Chicago, Ill.
Filed Oct. 20, 1969, Ser. No. 867,742
Int. Cl. G10h *1/00*
U.S. Cl. 84—1.01 **22 Claims**



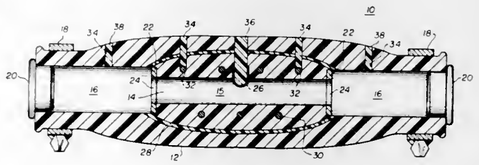
A radio frequency signal is placed on the pickup bus of an audio-keyed electronic organ. The connection is through a resistor and capacitor which form with the input resistors of the audio switches a voltage divider, whereby the level of radio frequency voltage on the bus changes upon closure of any key switch. The radio frequency is amplified and applied to a rectifier to produce a DC potential proportional to the level of the radio frequency, and this is applied through a capacitor to a utilization circuit. Hence as the DC level changes through the capacitor, it appears as a pulse or spike at the utilization circuit, and this pulse or spike is used to key rhythm or other accompaniment effects.

3,578,895
LEAD TERMINAL
Eugene J. Caires, Newtown, Conn., assignor to Vitramon, Incorporated, Monroe, Conn.
Filed June 9, 1969, Ser. No. 831,612
Int. Cl. H02g *15/02*
U.S. Cl. 174—74R **1 Claim**

The present invention relates to improved terminals for electrical components having bodies of thermoshrinkable material. More particularly, the present invention relates to a resilient sleeve adapted to be disposed within the body and electrically connected to elements therein and held in position in the body by the shrinking of the body around the sleeve and into holding engagement with the sleeve. The sleeve constituting a socket for receiving and holding a connector or a terminal lead wire.



3,578,896
ELECTRICAL CONNECTOR WITH FUSIBLE PLUG MEANS AND HEATING MATERIAL
Leslie S. Lynch, Martinsville, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Oct. 10, 1969, Ser. No. 865,346
Int. Cl. H02g *15/08*
U.S. Cl. 174—84R **10 Claims**

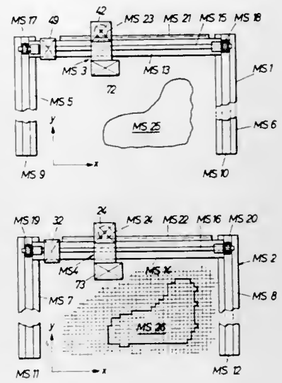


A connector for coupling at least one electrical conductor to a further conductor, or other element, comprising an outer insulating sleeve containing within a longitudinal passage therethrough a fusible plug of material for joining such elements. A heating member may be imbedded within the insulating sleeve about the fusible plug or external to the insulating sleeve and will upon operation cause fusion of the fusible plug. Ports may be provided from the outer surface of the sleeve to the heating member for external operation thereof and for the insertion of temperature sensing probe within the fusible plug. Seals for the various ports are provided to insure the integrity of the outer insulating sleeve.

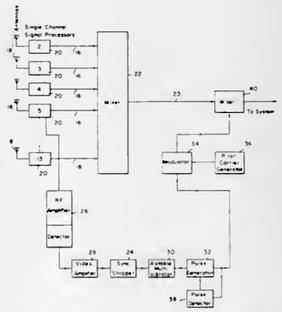
3,578,897
ARRANGEMENT AND PROCESS FOR REPRODUCING COLOR PATTERNS ELECTRONICALLY
Hans Joachim Stock, Freiburg im Breisagau, Germany, assignor to Franz Morat GmbH, Stuttgart-Vaihingen, Germany
Filed Dec. 27, 1967, Ser. No. 694,032
Claims priority, application Germany, Dec. 27, 1966, 72187/67
Int. Cl. H04n *1/10;* **B41m** *1/18*
U.S. Cl. 178—5.2 **17 Claims**

An arrangement whereby a given unscreened color pattern is scanned by an electronic scanning head. The pattern or design being scanned is stationarily mounted upon a coordinatograph. The scanning head is moved by the carriage of the coordinatograph in a line-wise manner so as to cover the entire surface of the color design. The scanning head generates electronic signals representative of the colors scanned and transmits them to a signal processing circuit for modifying the signals suitable for transmission to a remote location. A printing head mounted on another coordinatograph

is moved synchronously with the scanning head and receives the signal from the signal processing circuit. The printing head prints out a color pattern to a desired scale as a reproduction of the design being scanned.



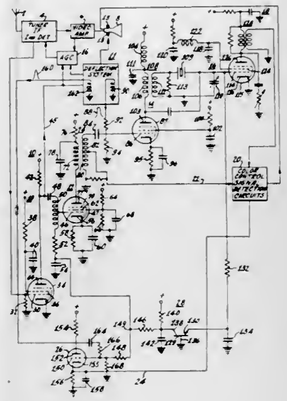
3,578,898
AUTOMATIC GAIN CONTROL FOR MULTICHANNEL TELEVISION SYSTEMS
Irving Kuzminsky, Silver Spring, and Ray B. Kauffman, Seabrook, Md., assignors to Entron, Inc., Silver Spring, Md.
Filed July 1, 1968, Ser. No. 741,497
Int. Cl. H04n *7/08*
U.S. Cl. 178—5.2 **6 Claims**



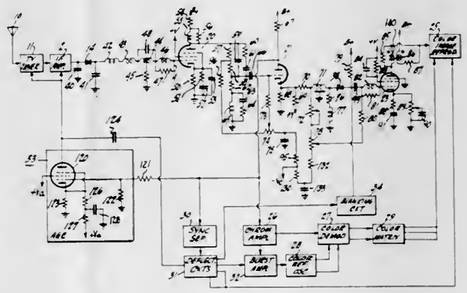
Automatic gain control means for a wide-band multichannel color television system, such as a community antenna TV system of the type in which the level of the pilot carrier controls the gain of the trunkline amplifiers. The invention is characterized in that the pilot carrier is modulated by a modulating signal that is a function of the sync signal stripped from the information signal of a given channel (specifically, channel 5). The pilot carrier signal is so modulated that the gain control is effected during the retrace time of the channel 5 signal, whereby any interference produced by the pilot carrier signal will not be visible on a television receiver and will therefore, not be objectionable.

3,578,899
AUTOMATIC CHROMA CONTROL CIRCUIT
James M. Yongue, Indianapolis, Ind., assignor to RCA Corporation
Filed May 29, 1967, Ser. No. 641,759
Int. Cl. H04n *9/48*
U.S. Cl. 178—5.4 **4 Claims**

A closed loop automatic chroma control circuit for a color television receiver is disclosed in which the grid leak current of an injection locked color reference oscillator is supplied to a transistor so as to produce an amplified ACC voltage.



3,578,900
VIDEO AMPLIFIER CIRCUIT
Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation
Filed May 13, 1968, Ser. No. 728,567
Int. Cl. H04n *9/48*
U.S. Cl. 178—5.4 **6 Claims**

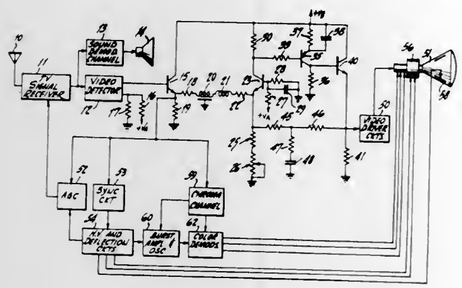


A video signal processing channel for use in a color television receiver employing a positively poled detector, a first amplifying stage coupled to the detector and a second amplifying stage coupled to the first for amplifying composite color television video signals. The output of the first stage is coupled by means of separate alternating current and direct current coupling means to the input of the second stage. The DC coupling path comprises a variable impedance which provides means for compensating for variations in characteristics of devices employed in the first and second stages, for selectively adjusting the DC level of the video signals applied to the second stage and for selecting an operating threshold for an automatic gain control circuit, the input of which is derived from the output of the second stage. The second stage provides input signals to each of the chrominance, AGC and synchronizing circuits of the receiver while furnishing a low impedance source of signals for the luminance delay line.

3,578,901
VIDEO AMPLIFIER FOR DRIVING A DELAY LINE BETWEEN GROUNDED COLLECTOR AND GROUNDED BASE

Dal F. Griepentrog, Indianapolis, Ind., assignor to RCA Corporation

Filed May 20, 1968, Ser. No. 730,335
Claims priority, application France, Oct. 3, 1967, 123101
Int. Cl. H04n *9/18*
U.S. Cl. 178—5.4R 11 Claims

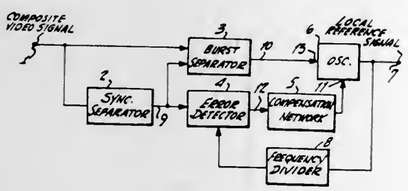


Transistorized luminance channel of a color television receiver includes emitter follower coupled to input of luminance delay line and common base amplifier coupled to delay line output. Low output impedance of emitter follower and low input impedance of common base amplifier permits reliable termination of both ends of delay line with resistors substantially matching characteristic impedance of delay line. Common emitter amplifier serves to amplify and invert output of common base amplifier, and inverted signal is applied to power output stage via common collector stage providing a low impedance output circuit. Negative feedback established by path between emitters of common collector and common base amplifiers ensures low source impedance required to adequately drive output stage; feedback path provides convenient facility for frequency response control.

3,578,902
APPARATUS FOR SYNCHRONIZED GENERATION OF A SIGNAL FROM A COMPOSITE COLOR VIDEO SIGNAL SUBJECTED TO SIGNAL PERTURBATIONS

John Monsay, Malvern, Pa., assignor to RCA Corporation

Filed Aug. 28, 1968, Ser. No. 755,895
Int. Cl. H04n *5/44*; H04l *7/00*
U.S. Cl. 178—5.4 3 Claims

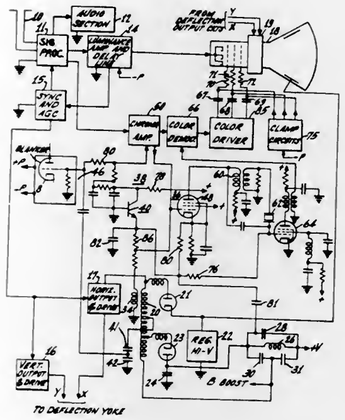


A technique is disclosed for providing a local reference signal in response to a composite color video signal. The frequency and phase of the reference signal are determined by certain signal portions of the composite signal. The nominal frequency of the reference signal is made to conform to a multiple of the horizontal synchronizing signal frequency portion of the composite signal. The reference signal is further influenced by the presence of the color burst signal portion of the composite signal, to synchronize the reference signal in phase and frequency to the burst signal.

3,578,903
CONTROL CIRCUITS FOR PREVENTING KINESCOPE COLOR SATURATION DURING BLOOMING

Donald H. Willis, Indianapolis, Ind., assignor to RCA Corporation

Filed Dec. 18, 1968, Ser. No. 784,730
Int. Cl. H04n *9/48*
U.S. Cl. 178—5.4 9 Claims

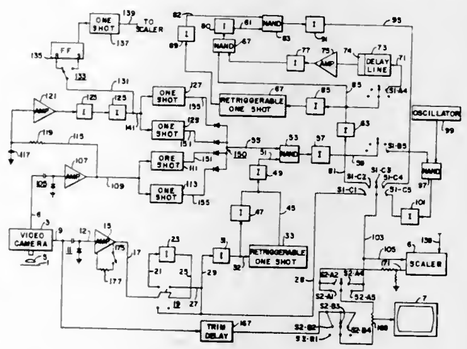


In a color television receiver a condition arises where the load demands on deflection circuitry causes blooming during a color transmission. These increasing load demands are detected in the receiver and the detected signal is used to reduce the gain and therefore the drive supplied by the chroma amplifier to the kinescope. The result is to decrease the load demands on the deflection circuitry by decreasing the chroma drive to the kinescope.

3,578,904
FEATURE COUNTER WITH FEATURE DISCRIMINATION AND/OR MASKING

Raymond D. Dewey, Bon Air; Robert S. Mapes, and Garth S. Jones, Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Oct. 15, 1968, Ser. No. 767,614
Int. Cl. G01n *15/02, 21/22*; H04n *7/00*
U.S. Cl. 178—6 23 Claims



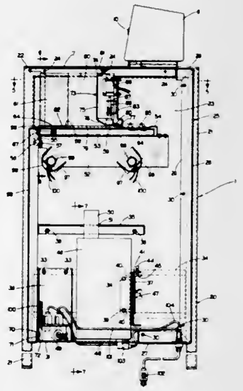
In the disclosed system a specimen is scanned by a video camera and the resulting video signals are applied to a digital logic circuit. The logic circuit is manually settable so that it produces signals only when the video camera scans features

of the specimen that are greater than a preselected width and darker (or lighter) than a preselected grey level. The logic system includes a delay line and an anticoincidence detector for comparing the signals developed during two consecutive line scans so that only a single count pulse is produced for each feature. A scaler is provided for counting the features scanned. Either the features counted or the count pulses may be displayed on a video monitor or the count pulses and features may be displayed simultaneously. A variable electronic mask is provided so that an operator may select any portion of a specimen for analysis.

3,578,905
SIGNATURE AUTHORIZATION AND VERIFICATION EQUIPMENT AND SYSTEM

Walter G. Anders, and Henry W. Kumpf, Jr., Canton, Ohio, assignors to Diebold, Incorporated, Canton, Ohio

Filed Jan. 14, 1969, Ser. No. 790,977
Int. Cl. A47b *81/06*; H04n *7/18*
U.S. Cl. 178—6 23 Claims



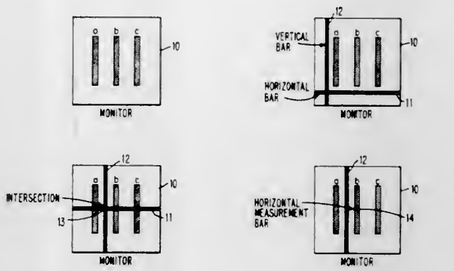
Banking service equipment is provided to permit one of a number of bank tellers to transmit a picture of a signature on a check by closed-circuit television to a monitor for one of a number of file clerks at a bank department where signature cards are filed, so that a file clerk can compare the signatures on the check and card, verify the authenticity of the signature on the check, and actually stamp the check to signify that the signature has been verified and that a banking transaction based on the check is authorized. The stamping is accomplished by an approval stamp located at the teller station actuated by pressing a button at the file clerk station. The equipment also is provided with means for signaling the teller in event that the file clerk determines that the signatures are not believed to be the same. This system enables entire responsibility for authorization to be placed on the file clerk.

3,578,906
CLOSE CIRCUIT TELEVISION MEASUREMENT SYSTEM

Larry W. Holmstrom, Vestal; James A. Tuttle, Endicott, and Harold J. Young, Vestal, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 24, 1969, Ser. No. 879,482
Int. Cl. H04n *7/18*
U.S. Cl. 178—6 10 Claims

A system designed to make linear measurements of an optical image in either a vertical direction or a horizontal direction for use in printed circuit manufacture wherein line-

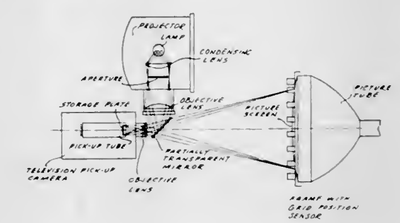


width and line-spacing measurements of printed circuits are made before and after etch.

3,578,907
OPTICAL-ELECTRONIC PICTURE STORAGE APPARATUS

Hans Joachim Stock, Freiburg Im Breisgau, and Gernot Gottschall, Boblingen, Germany, assignors to Franz Morat GmbH, Stuttgart-Vaihingen, Germany

Filed Sept. 13, 1967, Ser. No. 667,397
Claims priority, application Germany, Sept. 13, 1966, M70919/67
Int. Cl. H04n *3/22*
U.S. Cl. 178—6.8 6 Claims



An arrangement using optical-electronic techniques for storing a picture. A television picture tube has within it discrete photosensitive elements forming a picture to be stored. A television pickup tube is spaced from the picture tube and contains also discrete photosensitive elements. The photosensitive elements within the pickup tube correspond individually to the photosensitive elements in the picture tube. A simple amplifier amplifies the signals from the photosensitive elements so that they may be suitable processed. The image upon the picture tube is precisely reproduced upon the pickup tube by an image-forming arrangement. A grid pattern is provided on both tubes so that the two grids correspond identically in space and in time so that the image is precisely reproduced.

ERRATA

For Classes 178—6, 6.6, 7.3, 7.85 see:
Patent Nos. 3,579,249 thru 3,579,252

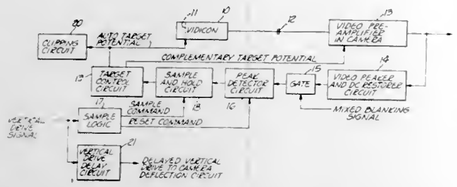
3,578,908
AUTOMATIC PEAK VIDEO CONTROL SYSTEM

William R. Tompkins, Pacific Beach, Calif., assignor to Cohu Electronics, Inc., San Diego, Calif.

Filed Dec. 5, 1968, Ser. No. 781,557
Int. Cl. H04n *5/19*
U.S. Cl. 178—7.2 14 Claims

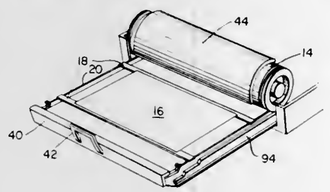
An automatic peak video control system for vidicon tubes in which the peak level of the video signal is detected and

stored during each field scan of the vidicon. The detected signal is sampled, compared with a reference voltage, and applied to the input of an integrating amplifier which controls



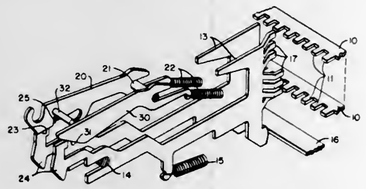
the target voltage of the vidicon in a manner such that the error between the peak video signal and the reference voltage will be reduced toward zero.

3,578,909
PAPER FEED CABLE INDEXING SYSTEM
Eric A. Von Hippel, Weston, Mass., and Charles C. Stimus, Jr., Danbury, Conn., assignors to Graphic Sciences, Inc., Danbury, Conn.
Filed Aug. 19, 1968, Ser. No. 753,542
Int. Cl. H04n *3/04*
U.S. Cl. 178—7.6 **18 Claims**



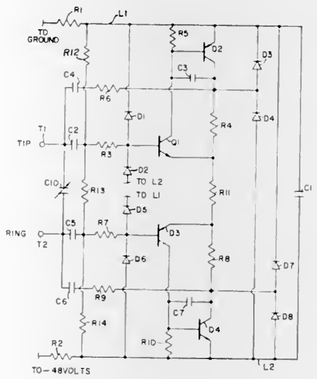
A portable facsimile transmitter and receiver has a rotatable, cylindrical drum for receiving a document which is to be reproduced by means of reading and reproducing heads adjacent the drum. Flexible crossbands bridged across cables wound helically around opposite edges of the drum hold the document on the drum during a reproduction cycle; the cables unwind from the drum during loading and unloading. For ease of loading, the drum is spring wound; a safety stop is provided to prevent premature reverse rotation of the drum during loading or unloading. A margin control enables adjustment of the reproduction cycle to accommodate documents of differing length. An arm extends against the drum when the drum rotation is to be stopped and locks the drum in a reference position at the end of each reproduction cycle to facilitate loading and unloading.

3,578,910
SIGNAL RESPONSIVE FUNCTION PERFORMING MECHANISM
Robert E. Arko, Mount Prospect, Ill., assignor to Teletype Corporation, Skokie, Ill.
Filed July 1, 1968, Ser. No. 741,460
Int. Cl. H04l *15/26*
U.S. Cl. 178—23 **10 Claims**



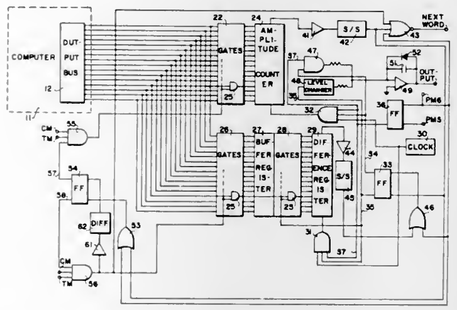
A function mechanism for producing an output upon receipt of any signal except a designated signal comprising a universal function bar responsive to all signals, a universal function pawl responsive to the universal function bar, a coded function bar responsive to the designated signal and means responsive to the coded function bar for preventing the universal function pawl from responding to the universal function bar.

3,578,911
TELEPHONE WIRE PAIR COMPENSATOR UTILIZING NEGATIVE CAPACITANCE CIRCUIT
Warren G. Bender, Wellesley, and Robert C. MacKenzie, Franklin, Mass., assignors to Communication Technology, Inc., Burlington, Mass.
Filed Feb. 12, 1970, Ser. No. 10,849
Int. Cl. H04b *3/18;* **H03h** *11/00*
U.S. Cl. 178—45 **11 Claims**



Apparatus is disclosed for compensating a telephone wire pair to alleviate transmission degradation caused by wiring capacitance. A negative capacitance effect is provided by employing positive capacitive feedback around each of two complementary transistor pairs. The pairs are also complementary in conductivity types with respect to each other and are connected effectively in series across a DC potential source so as to operate efficiently and in a balanced manner in a telephone environment.

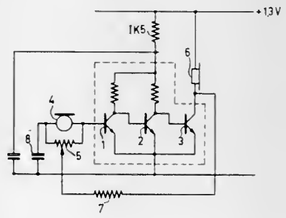
3,578,912
SOUND GENERATOR
William E. Beavers, Jr., Maryland City, and William H. Sturdevant, Bladensburg, Md., assignors to Singer-General Precision, Inc.
Filed Feb. 23, 1968, Ser. No. 707,615
Int. Cl. G10l *1/00*
U.S. Cl. 179—1 **9 Claims**



This invention comprises a system for digitally generating desired sounds under the control of a digital computer. The

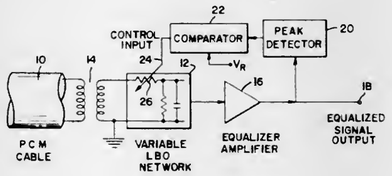
sound generator of this invention can be used to duplicate or synthesize available sounds. To accomplish this, the sound to be duplicated is analyzed to indicate which frequency bands are present in the sound and the relative amplitudes for each band. The actual generation of the sound is by a transducer, such as a loudspeaker, which is fed by the output of a flip-flop. The time duration of a complete cycle of the flip-flop determines the frequency of the signal being generated, and the duty cycle determines the amplitude of that signal. There are many different ways to achieve a duplicate of a known sound. For example, if the sound to be duplicated contains a fundamental frequency and primarily odd harmonics, then the output of the flip-flop, a rectangular wave, can be fed directly to the transducer. Other shaped waves, such as triangular waves, sine waves, etc., can be produced by the use of differentiating circuits, integrating circuits, filters, and the like. In addition, the harmonics can be generated and supplied simultaneously by using duplicate apparatus, or they can be generated in sequence using a single apparatus if they are sufficiently close in time to create the impression of a single, composite sound.

3,578,913
TRANSISTOR AMPLIFIER WITH NEGATIVE FEEDBACK VOLUME CONTROL
Pieter Johan Ufkes, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed May 13, 1968, Ser. No. 728,701
Claims priority, application Netherlands, June 9, 1967, 6708111
Int. Cl. H03f *3/00*
U.S. Cl. 179—1 **7 Claims**



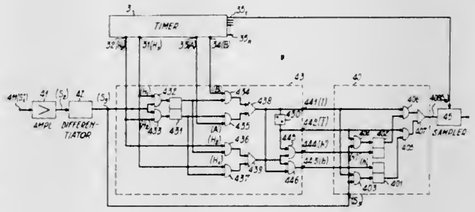
A hearing aid amplifier comprising a capacitor and a microphone in series across the amplifier input terminals and a volume control potentiometer in shunt with the microphone. A resistor connected between the amplifier output terminal and the movable arm of the potentiometer provides, at the input terminals, a DC negative feedback voltage and an AC negative feedback signal that varies with the adjustment of the Pot arm to provide volume control for the hearing aid.

3,578,914
EQUALIZER WITH AUTOMATIC LINE BUILD-OUT
Richard A. Simonelli, San Francisco, Calif., assignor to Lynch Communication Systems, Inc., San Francisco, Calif.
Filed Apr. 9, 1969, Ser. No. 814,680
Int. Cl. H04b *3/14*
U.S. Cl. 179—15 **5 Claims**



Automatic line build-out is provided in the equalizer stage of a PCM telephone repeater to correctly and continuously match the repeater automatically to any line length and to varying line parameters. To reduce the power requirements to a minimum, the circuit utilizes the equalized signal itself to determine the amount of degradation and to derive therefrom a control voltage which controls, without power consumption, the amount of series resistance inserted by the line build-out network between the cable and the equalizing circuit. The control is achieved by means of a field-effect transistor passively connected as a variable resistance.

3,578,915
TELEPHONE SWITCHING SYSTEM EMPLOYING TIME DIVISION AND DELTA-MODULATION
Yves H. Le Goffic, Pavillon 3, Saint-Roch, Lannion; Maurice F. Le Dorh, 34 rue Branly, Perros-Guirec, and Fernand R. Arnouat, Pen an Ru, Lannion, France
Filed June 19, 1969, Ser. No. 834,798
Claims priority, application France, June 21, 1968, 156,176
Int. Cl. H04m *3/24*
U.S. Cl. 179—15BY **3 Claims**



Telephone switching system employing delta-modulation which comprises a time-division switching network, a plurality of subscriber's telephone sets and, in the switching network, an equal plurality of subscriber's equipments connected to the subscriber's sets by four-wire subscriber's lines. Each subscriber's set comprises a delta-modulator for converting the analog signals produced by the telephone set into delta-coded pulses, a delta demodulator for converting delta-coded pulses coming from said switching network into analog signals applied to the telephone set, a timer and means for synchronizing said timer by said delta demodulator. The switching network comprises a timer defining sampling periods. Each subscriber's equipment comprises means for receiving delta-coded signals from the telephone subscriber's sets, a pulse converter and stretcher converting each delta-coded pulse received from a subscriber's set into a long pulse of the same binary value, having a duration equal to one sampling period and coincident with the full sampling period just following said delta-coded pulse occurrence time, means for sampling said long pulse during the time slots allocated to the subscribers and comprised within said sampling period, and means for transmitting delta-coded signals to said telephone subscriber's sets.

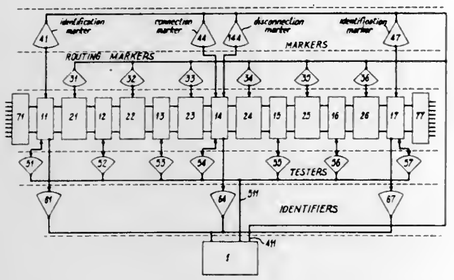
ERRATA

For Classes 179—6.3, 179—17, 179—18, 179—100 see: Patent Nos. 3,579,253 thru 3,579,256

3,578,916
TELEPHONE SWITCHING SYSTEMS
Pierre M. Lucas, 20 rue tariel, Issy-Les-Moulineaux, and Michel M. Rouzier, 15 Chemin de la Sabliere, Vauhallan, France
Filed Apr. 18, 1969, Ser. No. 817,403
Claims priority, application France, Apr. 19, 1968, 148,810
Int. Cl. H04q *3/42*
U.S. Cl. 179—18GE **2 Claims**

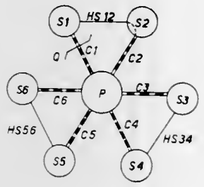
Device for detecting in a switching system including crosspoint matrices, those of said matrices which have faulty crosspoints. The switching system comprises crosspoint matrices interlaced with junctor stages whose junctors are in-

serted in the subscriber's lines connected to the outer matrices and in the intermatrix junction lines. The junctor stages are associated with identification markers capable of applying a pulse to a selected junctor and with identifiers capable of detecting said pulse response signal. When an



identification pulse in a first junctor gives rise to more than one pulse response signal in a second junctor, the matrices inserted between said first and second junctors are considered as faulty. They are withdrawn from the switching system when they are freed.

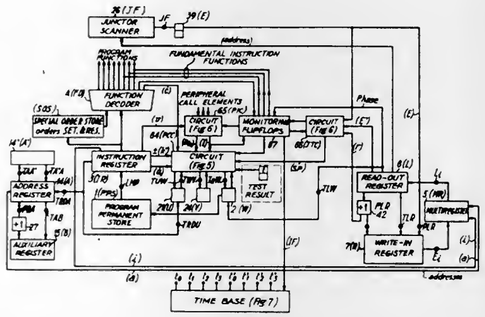
3,578,917
SECURITY CIRCUIT FOR MULTI-EXCHANGE TELECOMMUNICATIONS NETWORK
Charles Henri Emile Grandjean, Villejuif, (Val-de-Marne), and Jean Perrault, Port-Marly, (Yvelines), France, assignors to International Standard Electric Corporation, New York, N.Y.
Filed June 16, 1969, Ser. No. 833,579
Claims priority, application France, June 18, 1968, 155361
Int. Cl. H04q *3/56*
U.S. Cl. 179—18 **5 Claims**



In a telephone exchange comprising a central processor serving several satellite exchanges, a satellite is completely blocked when the cable which connects it to the processor is out of order. According to the invention, each pair of satellites is interconnected by means of a single communication channel so that the transfer of data between the processor and the satellite whose cable is out of order may be effected via another satellite.

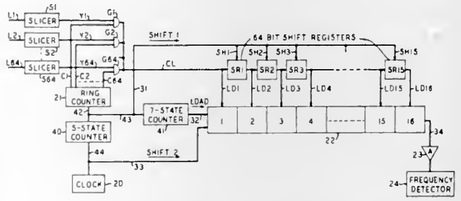
3,578,918
COMPUTER CONTROLLED SWITCHING SYSTEM USING FLIP-FLOPS FOR CONTROL OF REPETITIVE OPERATIONS
Pierre M. Lucas, 20 rue Tariel, Issy-Les-Moulineaux; Jean F. Duquesne, 120 rue de Javel; Jean-pierre L. Berger, 124 boulevard Auguste Blanqui, Paris, and Roger L. Courtois, 65 avenue Paul Vailant-Couturier, Gentilly, France
Filed Aug. 6, 1969, Ser. No. 848,063
Claims priority, application France, Aug. 8, 1968, 162,411
Int. Cl. H04q *3/54*
U.S. Cl. 179—18ES **2 Claims**

Digital computer for controlling telephone switching systems. The computer can be controlled selectively by two control circuits: a program permanent store and a group of flip-flops. The program permanent store has written therein contingent instructions relative to telephone communication establishment and release processing operations and is associated with a readout instruction register, an instruction address register and an auxiliary instruction address register. A multiregister has written therein register words containing data relative to the actual state of a telephone communication being processed, and this multiregister is associated with a readout register and a write-in register. The group of flip-flops controls repetitive operations, such as reading out from the readout register the register words, testing the potentials of points located in said switching system and rewriting in the write-in register the register words selectively modified according to the test results. A first means and a second means



for jumping from the control of the computer by said group of flip-flops to the control thereof by said program permanent store and vice versa are provided. The first means comprises means for comparing the results of two consecutive potential tests, means for counting the number of consecutive tests with unchanged results and means, controlled by both said comparing means and said counting means, for inhibiting said flip-flops, transferring in the instruction address register the address contained in the auxiliary instruction address register and activating the program permanent store. The second means comprises means for detecting a jump instruction in the readout instruction register, transferring in the auxiliary instruction address register the address of the jump instruction, inhibiting the program permanent store and activating the group of flip-flops.

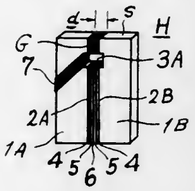
3,578,919
TIME COMPRESSION TONE DETECTOR
John F. O'Neill, Eatontown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 30, 1968, Ser. No. 787,876
Int. Cl. H04m *1/50;* **H04q** *5/10*
U.S. Cl. 179—84 **15 Claims**



In a frequency detection device time compression techniques are utilized for detecting the presence of a predetermined tone on any one of a plurality of communication channels. Signals appearing on the plurality of channels are sequentially sampled and stored in digital form. Information relating to individual channels is read out of storage and

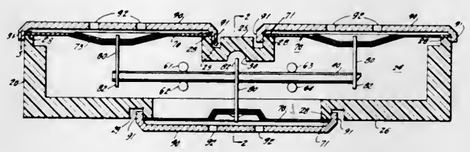
sent to the frequency detection device at a rate greater than the rate at which the individual channels are sampled.

3,578,920
FERRITE MAGNETIC HEAD WITH GAP SPACER OF SILICON OXIDE AND METAL OXIDES
Noriaki Okamoto, Kanagawa-ken; Teruo Wakabe, Tokyo, and Kazuo Nozawa, Chiba-ken, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed Mar. 12, 1969, Ser. No. 806,477
Claims priority, application Japan, Mar. 15, 1968, 43/16853
Int. Cl. G11b *5/24, 5/42*
U.S. Cl. 179—100.2C **3 Claims**



A magnetic head has a gap spacer between magnetic core members thereof, which spacer is constituted by at least one layer of a nonmagnetic metal oxide formed over a protective layer, such as, silica dioxide, on a gap-defining surface of the magnetic core members. The metal oxide layer is formed over the protective layer by heating on the latter an acid solution of a nonmagnetic metal halide or a solution of an organic metal salt, during which heating the protective layer prevents oxidation and etching of the underlying gap-defining surface.

3,578,921
MINIATURE MULTIPLE-DIAPHRAGM ACOUSTIC MECHANOELECTRIC TRANSDUCER DEVICE
William F. Knauert, Yonkers, N.Y., assignor to Sonotone Corporation, Elmsford, N.Y. Continuation of Ser. No. 634,736, Apr. 28, 1967, abandoned
Filed Jan. 26, 1970, Ser. No. 6,035
Int. Cl. H04r *7/00*
U.S. Cl. 179—139 **5 Claims**



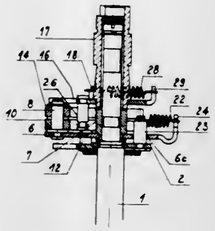
A miniature size electroacoustic signal transducer device has an elongated mechanoelectric transducer connected to a plurality of diaphragms for multiplying the transduced signal output.

ERRATA

For Classes 200—11, 200—148 see:
Patent Nos. 3,579,257 and 3,579,258

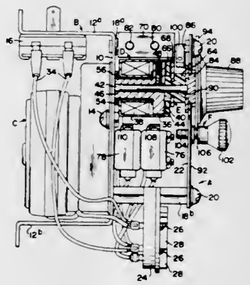
3,578,922
IGNITION DISTRIBUTOR
Roger Habert, Paris, France, assignor to Ducellier & Cie, Paris, France
Filed July 25, 1969, Ser. No. 845,019
Claims priority, application France, Aug. 1, 1969, 161489
Int. Cl. H01h *19/00*
U.S. Cl. 200—19R **2 Claims**

The advance curve of an ignition distributor is tailored to provide a desired degree of advance at cranking speed, a desired degree of retardation at low or engine idling speed, and thereafter a normal advance curve as the engine speed increases. The desired curve is obtained by the use of two



sets of centrifugal weights carried by an intermediate plate and having pins engaging in respective cam slots of a lower plate fixed to the distributor shaft and an upper plate fixed to the distributor cam.

3,578,923
ELECTROMAGNETICALLY CLUTCHED RESET TIMER
Fred E. Morey, III, and George B. Mork, Baraboo, Wis., assignors to Gulf & Western Industries, New York, N.Y.
Filed Jan. 16, 1969, Ser. No. 791,702
Int. Cl. H01h *7/08, 43/10, 3/32*
U.S. Cl. 200—38 **13 Claims**

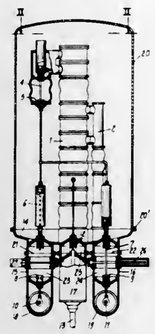


An adjustable reset timer comprising: a frame, a motor, and electromagnetic clutch assembly, drive means for interconnecting said motor and said clutch assembly, a clutch armature axially movable into and out of magnetically locked engagement with said clutch assembly and adapted to rotate in an operative direction from an initial preselected position to a final position, at least one switch affixed to said frame at a point corresponding to said final position, means for actuating said switch when said armature is in said final position, and means for selecting the initial position.

3,578,924
METAL CLAD SWITCH GEAR FOR HIGH VOLTAGES
Rintje Boersma, Harmelen, Netherlands, assignor to N. V. "-COQ" Utrecht, Netherlands
Filed Apr. 11, 1969, Ser. No. 815,345
Claims priority, application Netherlands, Apr. 23, 1968, 6,805,720
Int. Cl. H01h *31/00*
U.S. Cl. 200—48 **10 Claims**

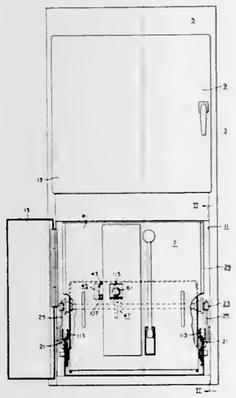
Metal clad switch gear for high voltages, all switches and accessories belonging to the same phase of a switching unit of the switch gear being accommodated in a common metal

vessel which consists of a base member supporting said switches and accessories and a hood which is detachably



secured with its lower rim to said base member and encloses said switches and accessories while remaining clear thereof.

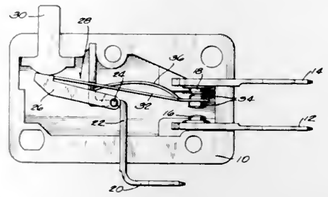
3,578,925
DRAWOUT-TYPE SWITCHGEAR
John L. Drown, Monroeville, and Nagar J. Patel, East McKeesport, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Nov. 24, 1969, Ser. No. 879,189
Int. Cl. H01h *9/20*
U.S. Cl. 200—50 **8 Claims**



Drawout-type switchgear comprises a levering-in mechanism for levering a circuit-interrupting unit into a connected position in a cell with improved means stopping movement of the circuit-interrupting unit when the circuit-interrupting unit reaches the connected position.

3,578,926
SNAP SWITCH
George Obermann, Niles, Ill., assignor to Controls Company of America, Melrose Park, Ill.
Filed Dec. 4, 1969, Ser. No. 882,080
Int. Cl. H01h *13/36*
U.S. Cl. 200—67 **3 Claims**

The compressed tongue of the switch blade is pivoted on the fixed support member while the side rails are under tension. The actuated end of the blade has integral pivot arms bent at 90° from the plane of the blade and pivoted on ears projecting from the support member. When the plunger is depressed, the side rails pass the pivot point of the tongue and cause the contact carrying end of the blade to snap

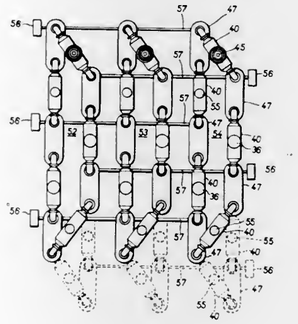


downwardly. The construction affords considerable overtravel with no adverse effect on contact pressure. The switch provides a high degree of contact wiping.

ERRATUM

For Class 200—83 see:
Patent No. 3,579,284

3,578,927
HIGH VOLTAGE SWITCHING ASSEMBLY
Adrian W. Roth, Aarau, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland
Filed Feb. 26, 1969, Ser. No. 802,604
Claims priority, application Switzerland, Feb. 29, 1968, Mar. 21, 1968, 3073/68;4413/68
Int. Cl. H01h *33/64, 9/40*
U.S. Cl. 200—145 **7 Claims**

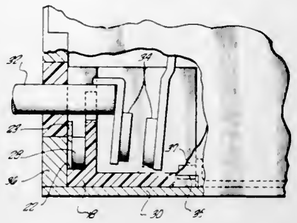


A high-voltage, fluid insulation switching station for a ring bus bar arrangement built up on a separate phase basis, having switching assemblies including three individually enclosed circuit breakers, earthing switches, instrument transformers and voltage transformers, cable dividing boxes and outdoor lead-throughs, the three circuit breakers with associated earthing switches and current transformers required for each connecting point of the bus bar arrangement being arranged within a T-shaped metal housing, wherein the individually enclosed circuit breakers of any one phase in parallel rows form, in sequence with T-shaped housings, a ring arranged, with like parts of the three phases being disposed on axes perpendicular to said parallel rows of circuit breakers.

3,578,928
SPRING MOUNTED ARC DEFLECTOR
John C. Schuessler, West Covina, and Roman J. Capol, Norwalk, Calif., assignors to Leach Corporation, South Pasadena, Calif.
Filed Nov. 22, 1968, Ser. No. 778,109
Int. Cl. H01h *9/34, 33/04*
U.S. Cl. 200—144 **3 Claims**

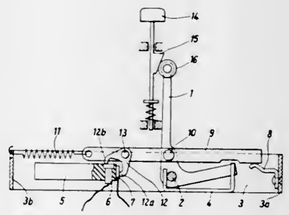
An improved arc deflector having a backing plate, a plurality of spaced-apart walls, and a recessed partition, which

members define compartments having an end wall and opposed sidewalls. A set of contacts of an electrical relay are enclosed within each compartment, the walls acting to



prevent arcing from one set of contacts to another. A retaining spring seats on a shelf of the backing plate and biases the compartmented enclosure against the relay container to hold the arc deflector immobile during use.

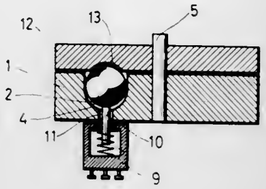
3,578,929
SLIDER SWITCH WITH ADJUSTABLE ABUTMENT ON FRAME, AND STATIONARY CONTACT FACES WITH AN ANGLE GREATER THAN 180° THEREBETWEEN BRIDGED BY A FORK SHAPED BRIDGING CONTACT
Horst Priebs, Bielefeld, Germany, assignor to Anker-Werke Aktiengesellschaft, Bielefeld, Germany
Filed Jan. 15, 1968, Ser. No. 697,885
Claims priority, application Germany, Jan. 17, 1967, A54637
Int. Cl. H01h *1/20, 1/18, 3/46*
U.S. Cl. 200—153 **7 Claims**



A switch slider of an electric switch is linked with an actuating member and is reciprocably movable by the actuating member. A spring applies a force to the switch slider to position an electrically conductive bridge member pivotally mounted on the switch slider in electrical bridging contact with a pair of spaced electrical contacts positioned in fixed relation to each other and to maintain good electrical contact between the bridge member and the contacts by relative motion of the bridge member and the contacts.

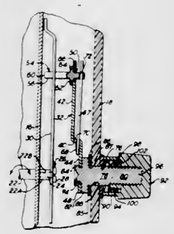
3,578,930
MULTIPLE ELECTRIC SWITCH
Wolfgang Tiefenthaler, Rosenheim, Wehrfleck, Germany, assignor to Messerschmitt-Bolkow Gesellschaft mit beschrankter Haftung, Munich, Germany
Filed Apr. 1, 1969, Ser. No. 811,799
Claims priority, application Germany, Apr. 6, 1968, Oct. 22, 1968, B75308;G6803301
Int. Cl. H01h *3/00*
U.S. Cl. 200—153 **7 Claims**

A multiple electric switch includes a spring-biased ball mounted as a locking element in a member connected to a switch shaft, and a plate formed with locking positions in the form of recesses and with guiding means to guide the ball relative to the recesses. Individual sets of switch contacts, such as microswitches, having respective operating members, are mounted as part of the switch and the operating members project into respective recesses for engagement by the ball when the latter enters the recess, to operate the associated switch contacts. The multiple switch may be a rotary switch, a linear switch or a band switch, and the band switch may be



combined with either the rotary switch or the linear switch. The recesses have a close conforming fit with the ball such that an operating member is actuated only when the ball is fully seated in the associated recess.

3,578,931
SELF-CLEANING ELECTRICAL SWITCH CONTACT
Frank W. Murphy, and Frank W. Murphy, Jr., 3131 S. Sheridan P.O. Box 45248, Tulsa, Okla. 74145
Filed Jan. 15, 1970, Ser. No. 003,112
Int. Cl. H01h *1/18*
U.S. Cl. 200—166BD **10 Claims**

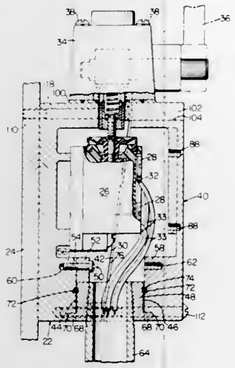


An electrical switch including a movable switch arm, a switch contact engageable and movable with said switch arm to close an electric circuit, and wherein the contact is spring-biased to constantly engage within a seat and to wipe therein upon engagement and disengagement of said switch arm, and to return the contact to its original position.

3,578,932
REVERSIBLY MOUNTABLE LIMIT SWITCH CONSTRUCTION
Ronald W. Holmes, Freeport, Ill., assignor to Robertshaw Controls Company, Richmond, Va.
Filed June 17, 1968, Ser. No. 737,658
Int. Cl. H01h *9/02*
U.S. Cl. 200—168 **6 Claims**

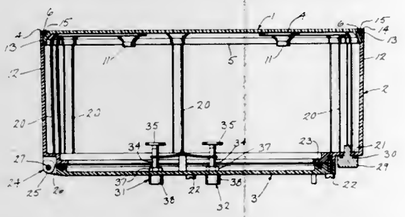
This application discloses a limit switch having a cup-shaped switch-supporting casing with an open rim, and a cup-shaped switch cover casing with an open rim. Either of these casings may be mounted on a support wall with its rim exposed. Then the other casing may cover the supported casing, rim to rim, to form a combined closed casing. The switch-supporting casing has an operator head at the top and a powerline-receiving notch at the bottom. The switch cover casing has a powerline-receiving notch at the bottom. Prong receptacle means may be added to the switch cover casing so

that the powerline terminals may be attached thereto and prongs may be added to the switch support casing, when the



switch cover casing is attached to the support wall as a plug-in installation.

3,578,933
CORROSION-RESISTANT ENCLOSURE
Woodrow A. De Smidt, and Edward H. Kuhn, Milwaukee, Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.
Filed Sept. 12, 1969, Ser. No. 857,512
Int. Cl. H01h *9/04*
U.S. Cl. 200—168 **7 Claims**



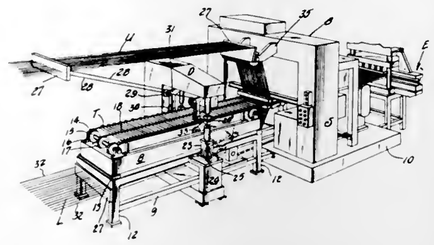
A corrosion-resistant enclosure is disclosed for electrical switches, such as across the line motor starters and safety disconnect switches, that is made of a reinforced resin. The enclosure has a unitary backplate with a backwall and forwardly turned flange, a four-sided body open at the back to receive the backplate and fit snugly about the backplate flange, a sealing material bonding the backplate and body together, and a cover hinged to the body by integral hinge straps that retain the sealed integrity of the enclosure. The components of the enclosure are of molded, reinforced resin having a high degree of resistance to corrosive environments.

ERRATA

For Classes 219—56, 219—98, 219—154, 219—295, 219—486 see:
Patent Nos. 3,579,259 thru 3,579,264

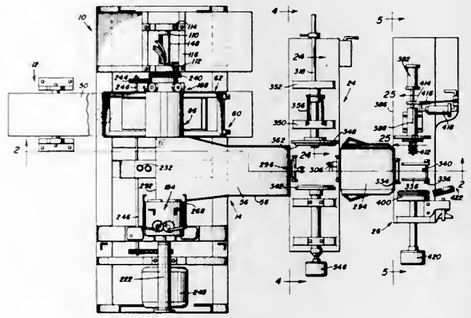
3,578,934
WIRE CONDENSER MAT WELDER AND METHOD OF FORMING
Rene G. Beauvais, 1614-3rd St., Bay City, Mich. 48706
Division of Ser. No. 582,042, Sept. 26, 1966, Pat. No. 3,460,225.
Filed Feb. 24, 1969, Ser. No. 825,468
Int. Cl. B23k *11/00;* **B63h** *9/04*
U.S. Cl. 219—56 **17 Claims**

Apparatus for manufacturing wire condenser mats wherein at least one rigidifying wire is spot welded to a series of cross-wisely extending connected loops to rigidify the mat structure and insure proper spacing of the loops. The rigidified



structure is then passed to a second welding station where a wire field is welded to the loops to complete the condenser mats.

3,578,935
AUTOMATIC DRUM-FORMING MACHINE
Clifford T. Deane, St. Albans, W. Va., assignor to Stampco, Inc.
Filed Feb. 10, 1969, Ser. No. 816,137
Int. Cl. B23k *1/16*
U.S. Cl. 219—64 **15 Claims**

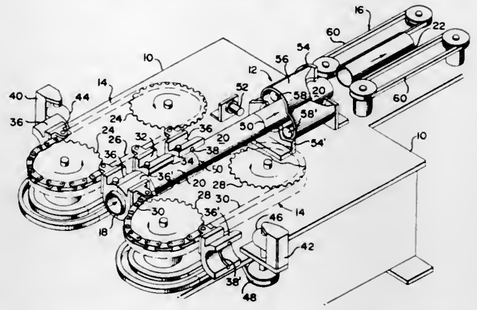


Sheet metal stock is initially formed into a cylinder by sequential cutting, bending and seam-welding operations. The cylinder then undergoes necking and flanging operations prior to transfer to a final assembly station at which a lid is applied and seamed to the cylinder as its wall is swaged. The cutting, welding and metal-deforming operations as well as transfer of the workpiece from one station to another is performed automatically by a hydraulic-electrical control system.

3,578,936
CONTAINER BODY SEPARATION UTILIZING RADIATION DISCRIMINATION
Howard L. Gerber, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Apr. 23, 1968, Ser. No. 450,391
Int. Cl. F27b *9/06;* **F27d** *11/00*
U.S. Cl. 219—388 **45 Claims**

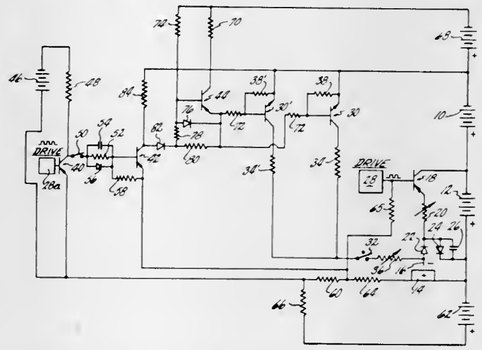
An apparatus and method for separating tube portions from a continuous length of tubing is disclosed herein. The tubing is advanced past a marking station wherein a circumferential bank of heat absorbent material is applied to the tubing. The tubing is then advanced through a housing supporting radiant energy source provisions which direct radiant energy onto the tubing, the energy being absorbed by the circumferential band to effect severance of the tubing. A second conveyor moving at a slightly higher linear rate than

the tubing engages the severed tubing portion to assist separation at the circumferential band. Increase radiant ener-



gy absorption may, alternatively, be achieved by circumferentially scoring the tubing.

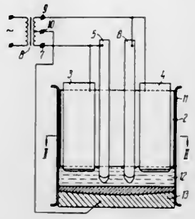
3,578,937
ELECTRICAL DISCHARGE MACHINING POWER SUPPLY CIRCUIT OF THE SUPERIMPOSED VOLTAGE TYPE
Kurt H. Sennowitz, Royal Oak, Mich., assignor to Elox Inc., Troy, Mich.
Filed Aug. 21, 1969, Ser. No. 852,023
Int. Cl. B23p *1/08*
U.S. Cl. 219—69 **11 Claims**



A circuit for providing EDM machining pulses from a pair of different magnitude voltage sources. A pair of electronic switches such as transistors are employed to pulse the sources, either separately or additively to control the magnitude of the machining pulses applied and thereby control the mode of machining from roughing to finishing.

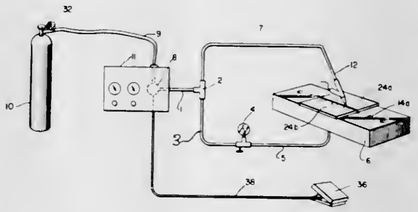
3,578,938
METHOD OF ELECTROSLAG WELDING
Boris Izailevich Medovar, Bulvar Lesi Ukrainki, 2, kv. 8; Daniil Andreevich Dudko, pereulok Mechnikova, 3, kv. 7; Vitaly Mikhailovich Baglai, ulitsa Semanshko, 10, kv. 54/3; Oleg Petrovich Bondarenko, Kreschatik, 15, kv. 34; Albert Nikolaevich Sevruk, ulitsa Ezhena Potie, 9, kv. 89; Rudolf Solomonovich Dublinsky, Brest Litovsky prospekt, 11, kv. 15; Vladimir Prokhorovich Andreev, ulitsa B. Kitaevskyaa, 99, kv. 13; Georgy Grigorievich Andrianov, Bulvar Lenina, 30, kv. 26; Valentin Stepanovich Sindeev, Bulvar Druzhby Narodov, 14, kv. 13; Anatoly Nikolaevich Safonnikov, ulitsa Filatova, 1/22, kv. 78, and Igor Ivanovich Suschuk-Sljusarenko, ulitsa Vyborgskaya, 80/17, kv. 94, Kiev, U.S.S.R.
Filed Apr. 8, 1969, Ser. No. 814,399
Claims priority, application U.S.S.R., Apr. 8, 1968, 1231246
Int. Cl. B23k *9/18*
U.S. Cl. 219—73 **5 Claims**

A method of electroslag welding, enabling metal parts of great thickness to be welded together, wherein stationary and movable consumable electrodes are disposed equidistantly in relation to the surfaces of parts to be welded together, the



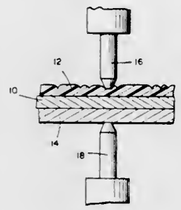
movable electrodes being rigid and not bendable along the weld seam being made as they are immersed into a slag bath.

3,578,939
BACKING GAS ATTACHMENT SAVING DEVICE FOR HELIARC WELDING
Randolph E. Green, 8 Woodbine St., Roxbury, Mass. 02119
Filed Oct. 15, 1968, Ser. No. 768,200
Int. Cl. B23k *9/16*
U.S. Cl. 219—74 **4 Claims**



A backing gas attachment for conserving backing gas during heliarc welding provides simultaneous control of the flow of cover gas and backing gas to a piece being welded. This prevents waste of the backing gas when its use is not required.

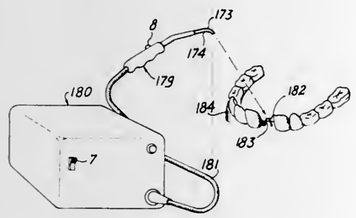
3,578,940
WELDING PROCESS
Oran J. Sands, Columbus, Ind., assignor to Arvin Industries, Inc., Columbus, Ind.
Filed Feb. 20, 1969, Ser. No. 801,065
Int. Cl. B23k *9/28, 11/10*
U.S. Cl. 219—91 **2 Claims**



A welding apparatus and method for spot welding a first metal workpiece having a plastic-covered surface to a second metal workpiece. The two workpieces are placed in metal-to-metal engagement and clamped between the electrodes of two aligned welding guns, a first electrode engaging the plastic surface of the first workpiece and a second electrode engaging the second workpiece. At a point spaced from the second electrode, the metal of the second workpiece is en-

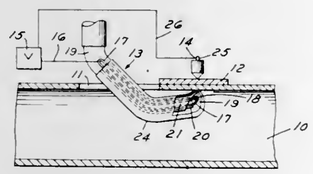
gaged by a contact member between which and the second electrode an electric current can flow through the metal. The second electrode is connected to one terminal of a welding-current source the other terminal of which is connectable through appropriate switch means alternatively to the contact member or to the first electrode. With the contact member connected to the current source heat generated by current flow through the metal of the workpieces softens the plastic to enable the first electrode to penetrate it and engage the metal substrate. Thereupon, the switch means is operated to disconnect the contact member from the power source and connect the first electrode thereto, thus permitting welding current to flow between the two electrodes through the metal. A timing mechanism is provided to control automatically the supply of current and the operation of the welding guns and switch means.

3,578,941
SURGICAL ELECTRIC WELDING APPARATUS
Jacques Robert Webert, Montrouge, France, assignor to Commissariat a l'Energie Atomique, Paris, France
Filed Mar. 7, 1969, Ser. No. 805,213
Claims priority, application France, Dec. 31, 1968, 182649
Int. Cl. B23k *11/26*
U.S. Cl. 219—114 **12 Claims**



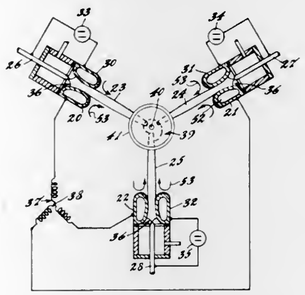
A surgical electric welding apparatus for interconnecting bone implantations, said apparatus comprising a transformer whose primary winding may be connected to an electric energy source, two welding electrodes connected to the terminals of the secondary winding of the transformer by means of a flexible cable and held in a handle, an electronic unit for controlling the closure of the feeding circuit of said primary winding and safety means for preventing said circuit from being improperly closed.

3,578,942
WELDING ELECTRODE ASSEMBLY
Leonard J. Bugaj, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Continuation-in-part of application Ser. No. 769,785, Oct. 23, 1968, now Patent No. 3,525,848. This application Oct. 14, 1969, Ser. No. 866,352
Int. Cl. B23k *9/24, 11/30*
U.S. Cl. 219—119 **7 Claims**



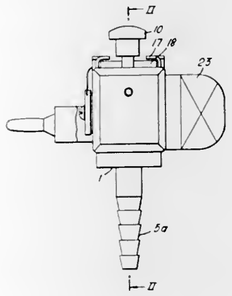
A welding electrode assembly includes a metal-welding electrode and a voltage-sensing wire welded at one end to the lower portion of the electrode. A layer of insulating material is positioned between the wire and the electrode along at least the portion of the wire which extends along the surface of the electrode. A layer of nonconductive material is placed over the outer surface of the electrode and the wire. A thin layer of conductive paint is placed over the nonconductive material layer. A layer of electrodeposited material is placed on the layer of conductive material. The electrodeposited material is formed from a material highly resistant to scratching and marring when engaged by sharp edges of metal articles.

3,578,943
PROTECTIVE COATING FOR PLASMA APPARATUS
Henry P.J.F.M.C. Schoumaker, Jette, Belgium, assignor to La Soudure Electrique Autogene, Procedes Arcos, Brussels, Belgium
Filed Aug. 27, 1969, Ser. No. 853,471
Claims priority, application Belgium, Mar. 19, 1969, 71,514
Int. Cl. B23k *9/00*
U.S. Cl. 219—121 **3 Claims**



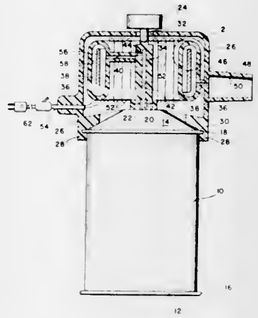
A plasma nozzle and process for treating plasma nozzles used in operations with reactive gases in which a face of the nozzle, preferably the front face, is provided with means to protect against corrosion from reactive gases, the means consisting of a coating of a metallic element or alloy within the group consisting of gold, platinum, palladium, rhodium, iridium, osmium and or ruthenium.

3,578,944
WELDING ASSEMBLAGE
Arieh Kermen, Dimona, Israel, assignor to The State of Israel, Atomic Energy Commission, Beer-Sheba, Israel
Filed June 18, 1969, Ser. No. 834,363
Claims priority, application Israel, July 4, 1968, 30308
Int. Cl. B23k *9/00*
U.S. Cl. 219—130 **3 Claims**



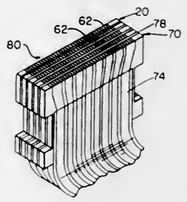
Welding equipment particularly for arc-welding a junction of two wires, for example, for forming a thermocouple junction wherein the junction is held by means of a gripping unit of substantial heat capacity, the gripping unit consisting of two constituent elements which can be displaced with respect to each other so as to vary the aperture defined between the elements and designed to receive the junction.

3,578,945
HEATER FOR AEROSOL FOAM-DISPENSING CONTAINERS
John Ayres, Mountainside, and Irving Reich, Princeton Junction, N.J., assignors to Carter-Wallace, Inc., New York, N.Y.
Filed Feb. 20, 1969, Ser. No. 800,982
Int. Cl. B67d *5/62;* **H05b** *5/00*
U.S. Cl. 219—214 **7 Claims**



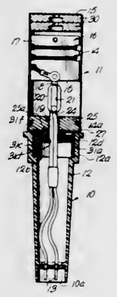
An electric heating device for heating foam products as they are discharged from an aerosol container by passing the foam in direct contact with the hot surfaces of the secondary winding of a stepdown transformer. The device includes a housing having an inlet admitting pressurized foam from the aerosol container and an outlet for discharge of unpressurized foam. A toroidal shell mounted in the housing forms an annular flow path between the inlet to the outlet. The stepdown transformer includes a multiturn primary wound about the outer surface of the shell and a cylindrical iron core centered within the shell and a single-turn closed secondary winding that is formed by a thin plating of cadmium or copper on the core.

3,578,946
THERMAL PRINT HEAD WAFER AND METHOD OF MAKING THE SAME
William L. Colello, Troy, Ohio, assignor to The National Cash Register Company, Dayton, Ohio
Filed Oct. 27, 1969, Ser. No. 869,700
Int. Cl. H05b *1/00*
U.S. Cl. 219—216 **17 Claims**



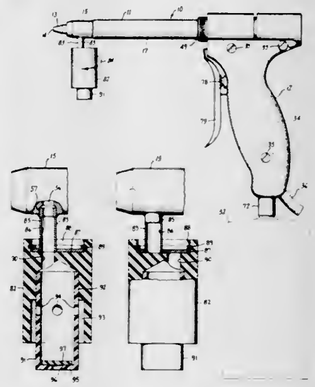
A thermal print head wafer including a dielectric substrate having one end whose sharp edges are removed (by grinding) to provide a continuous, blended surface between an intended printing surface of the substrate and opposed flat sides thereof. The blended surface has small grooves in the surface thereof, which grooves are aligned parallel to a direction in which the print wafer moves relative to a thermally responsive record medium with which the printing wafer is used. A layer of semiconductor material is deposited (by pulse spraying) on the blended surface while a portion of the substrate is heated in a furnace, and the deposited material is separated into discrete, spaced resistive elements by high-pressure spraying of abrasives at the semiconductor material through a slitted U-shaped mask. Electrical conductors (located on the opposed flat sides) of the substrate are connected to the ends of the resistive elements, enabling them to be selectively energized.

3,578,947
ELECTRICALLY HEATED HAIR-CURLING INSTRUMENT
Samuel L. McNair, Overland Park, Kans., assignor to The Songrand Corporation, Kansas City, Mo.
Filed May 3, 1968, Ser. No. 726,620
Int. Cl. A45d *2/36;* **H05b** *3/06*
U.S. Cl. 219—226 **1 Claim**



A hair-curling instrument embodies a heat conductive shell which is internally heated by an electric heating element and which is supported from a hollow handle by means of an arrangement which inhibits the transfer of heat from the heating element to the handle. A tubular rivet extending through an aperture in an end closure on the shell and an opening in the end of the handle holds the handle and shell in axial alignment. The heating element leads pass through the rivet. Thermally nonconductive spacers secured to the handle end and seated in recesses in the shell end closure are interposed between the shell closure and the handle end so as to define air gap between the confronting surfaces of the handle end and the closure member.

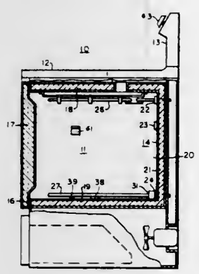
3,578,948
SOLDERING AND DESOLDERING HAND TOOL EMPLOYING AIR BLAST OR SUCTION
Aaron L. Friend; Arthur G. Patterson, and James G. Wilen, Phoenix, Ariz., assignors to General Electric Company
Filed Mar. 19, 1969, Ser. No. 808,573
Int. Cl. B23k *3/06*
U.S. Cl. 219—230 **24 Claims**



A soldering and desoldering device includes a heating unit and a soldering tip having an end for engagement with a sol-

dered joint and having a first passage opening at its end. A second passage is provided having an exit opening and communicating with the first passage such that pressure fluid flowing through the second passage out the exit opening is effective to aspirate air from the first passage. Means including a manually actuatable valve are provided for controllably supplying pressure fluid from a source of pressure fluid to the second passage. An adjustable device is mounted for adjustment between a first position wherein it prevents pressure fluid from leaving the exit opening and causes it to flow through the first passage out the end of the soldering tip, and a second position wherein it permits pressure fluid to flow out the exit opening to aspirate air from the first passage. A container is mounted by the adjustable device to form therewith a unitary structure, the container receiving molten solder which passes through the first passage and the exit opening from the soldered joint in response to actuation of the valve when the adjustable device is in its second position. The container is formed of a thermoplastic material, such as the material known as Teflon, having a nonstick finish to prevent adherence of solder to the inner walls of the container.

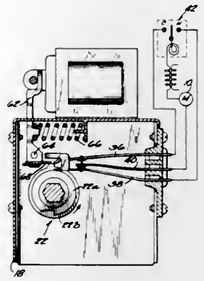
3,578,949
COMBINATION BAKE AND AUXILIARY BROIL HEATER FOR A COOKING APPLIANCE
Paul M. Weyrick, Ashland, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Apr. 4, 1969, Ser. No. 813,444
Int. Cl. F27d *11/02*; **H05b** *1/00*
U.S. Cl. 219—403 **5 Claims**



Cooking apparatus having a heater structure which is utilized both as a bake heater and a auxiliary broil element. The heater structure is characterized by its capacity to distribute heat over the entire oven when used as a bake heater and to concentrate the heat when used as a auxiliary broil element, the former being accomplished while the heater structure is positioned adjacent the bottom wall of the oven liner and the latter while the structure is supported closer to the top wall thereof.

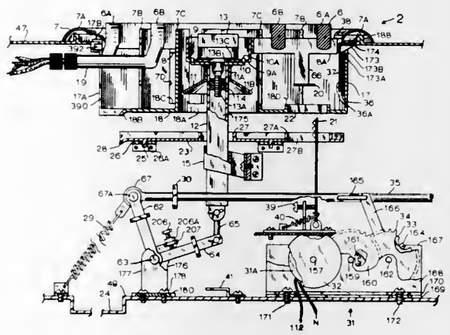
3,578,950
ELECTRIC HEAT SEQUENCE CONTROL
Clyde C. Moratz, Brookfield, Wis., assignor to Controls Company of America, Melrose Park, Ill.
Filed July 7, 1969, Ser. No. 839,511
Int. Cl. H05b *3/00*
U.S. Cl. 219—486 **6 Claims**

When the thermostat calls for heat the motor starts and rotates the cam bank to start the fan first and then place the heaters on the line in sequence. After all heaters are on the line the motor circuit is transferred to control by the cold contact of the SPDT thermostat so the motor will stop and keep all heaters on the line until the thermostat is satisfied at which time the heaters are taken off the line in sequence. Once the sequence starts it must be completed notwithstanding changes in the thermostat condition. The only exception is limit switch opening or power failure causing deenergization of the solenoid allowing the spring biased lever to open



all heater circuits and require homing the control at its starting point before heaters can be put back on the line.

3,578,951
ELECTRIC STOVES
Benedict Ingrao, Elmwood Park, Ill., assignor to John Ingro Jr., Albuquerque, N. Mex., fractional part interest
Filed Dec. 26, 1967, Ser. No. 693,270
Int. Cl. H05b *3/68*
U.S. Cl. 219—444 **50 Claims**

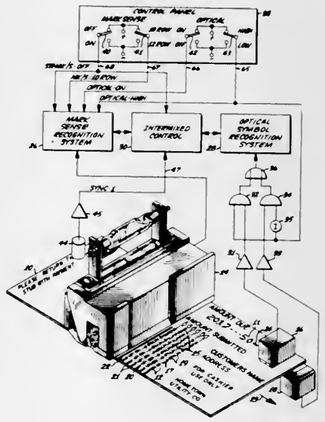


Electric stoves in which the relative vertical movement of a pot support and an electric heating element is controlled to control heat, the heating element and the pot support having surface means in horizontal planes. The surface means of the heating element may include at least one portion interposed between horizontally spaced portions of the surface means of the pot support, the heating element preferably including a plurality of generally annular portions at differing radial distances from a central vertical axis. In another embodiment, the pot support includes a thin flat plate portion. In one type of construction, the heating element is moved vertically while in another the pot support is moved vertically. Important features of the invention relate to means for controlling the relative vertical movement, both manually and automatically, with temperature sensing means being usable in conjunction with the control. The control means may control electrical energization of the heating element while also controlling the relative movement of the heating element and the pot support.

3,578,952
TUBULAR ELECTRICAL HEATING ELEMENT WITH A SEGMENTED HELLICAL FIN
Robert C. Boose, Mayes, Okla., assignor to Escoa Fintube Corporation, Pryor, Okla.
Filed June 5, 1969, Ser. No. 838,722
Int. Cl. H05b *3/50*
U.S. Cl. 219—540 **7 Claims**

The disclosure describes a tubular electrical heating element comprising a cylindrical sheath having a helical fin attached thereto. The cylindrical sheath includes a heating coil disposed within the interior of the sheath and a quantity of insulating material compacted between the coil and the sheath. The fin includes a plurality of segmented L-shaped blades having a continuous base that is helically wound around the cylindrical surface of the sheath and is bonded thereto by a plurality of spot welds extending along the length of the base.

3,578,953
SYSTEM FOR READING INTERMIXED MARKS AND SYMBOLS FROM DOCUMENTS
Richard E. Milford, and George Maclean, Phoenix, Ariz., assignors to Honeywell Information Systems Inc.
Filed Oct. 3, 1968, Ser. No. 764,660
Int. Cl. G06r *7/00*
U.S. Cl. 235—61.11 **12 Claims**

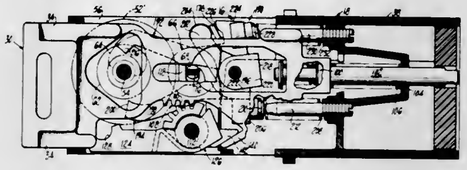


A system for automatically reading marks and symbols printed on one or more sides of a document in one or more different formats.

ERRATA

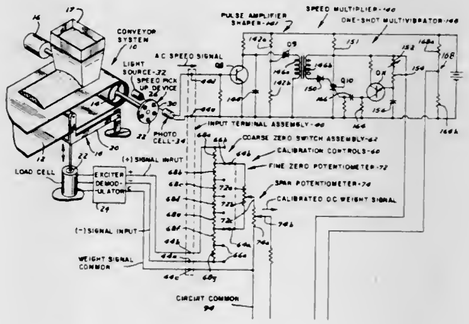
For Classes 235—61, 235—155, 235—189 see:
Patent Nos. 3,579,265 thru 3,579,268

3,578,954
HIGH SPEED MAGNETIC COUNTER
James P. Barrett, West Hartford, and John G. Gamble, Weatogue, Conn., assignors to Veeder Industries, Inc., Hartford, Conn.
Filed Oct. 4, 1967, Ser. No. 672,786
Int. Cl. G06m *1/04*
U.S. Cl. 235—92 **12 Claims**



A resettable high speed magnetic counter includes a drive mechanism which permits the unidirectional advance of the counter's number wheels by retracting independently mounted verge drive arms. The reset button of the counter is adapted to spread the independent verge arms during the reset operation to thereby disengage the verge from the star wheel and enable the use of a direct driving engagement between the star wheel and the lowest order number wheel. The reset mechanism of the counter provides for delayed withdrawal of the reset fingers from the heart shaped reset cam after reset of the number wheels pending reengagement of the transfer pinions with the gears of the number wheels. The transfer pinions of the counter are suitably contoured to enable only transfer in a single rotatable direction with an interference lock preventing rebound inaccuracies. The magnet employs an E-shaped core limiting the flux path of the magnet to the core and flux plate while eliminating the clapper pivot from the flux path.

3,578,955
TOTALIZER FOR INTEGRATING THE PRODUCT OF TWO VARIABLES WITH DIGITAL REGISTRATION
Gerald P. Kloven, White Bear Lake, Minn., assignor to Ramsey Engineering Company, St. Paul, Minn.
Filed Mar. 18, 1968, Ser. No. 713,758
Int. Cl. H03k *25/02*
U.S. Cl. 235—92 **15 Claims**



A capacitor is charged with a DC current obtained from a voltage signal that is proportional to a first variable, such as the weight of material on a prescribed section of a conveyor belt. Each time that the accumulated charge on the capacitor reaches a specific level, the capacitor is automatically discharged to provide an output pulse. The repetition rate or frequency of these pulses is proportional to the signal voltage and hence the magnitude of the first variable. By causing these pulses, or a percentage of such pulses, to flow to a pulse counter, the count registered during the period of pulse

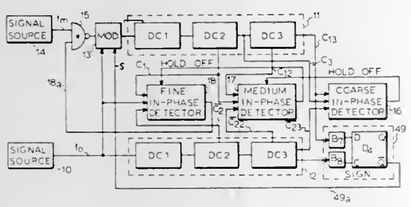
flow will indicate the time integral of the first variable, and in the conveyor case the amount of conveyed material when the belt is moving at a constant speed.

However, where the integral is influenced by another process variable, such as a variance in the conveyor belt speed, the count that is registered will not be an accurate indication of the total material discharged from the conveyor. Provision is made for modifying the number of pulses reaching the counter so that the total pulse count will reflect therein the variable belt speed. By way of an AC signal having a frequency proportional to the conveyor speed and circuitry controlled thereby, the current for charging the capacitor is alternately directed to the capacitor for a first period and then diverted from the capacitor for a second period. Means are employed for retaining the accumulated charge on the capacitor during each second period. In this way, pulses flow to the counter only during successive first periods and no pulses flow during successive second periods. By making the ratio of pulse flow time to total time, that is, the ratio of each first period to the sum of that first period and the following second period, proportional to the magnitude of the second variable, which is the belt speed in the illustrated situation, the counter registration then indicates the product of the two variables. In other words, there is produced a speed integral in which the counter registration denotes the quantity of material discharged from the conveyor even through both the rate of material and the belt speed vary.

The capacitor is discharged many times each second. Pulse-divider circuitry accurately divides this high pulse rate down to a more usable range, thereby utilizing the above-mentioned percentage of pulses. A rate member is included and provision is made for providing a coarse zero and fine zero setting to indicate both zero rate on the meter and a zero counting rate on the counter for the condition of either (or both) the magnitude of the DC voltage or the frequency of the AC signal being zero. By means of a span adjustment a wide range in magnitudes of the DC input signal can be made to represent full scale on the rate meter.

3,578,956
PHASE MODULATOR OF TWO DYNAMIC COUNTERS

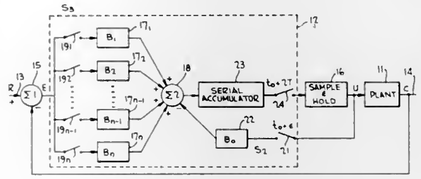
Amiel J. McCall, South Euclid, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.
Filed May 13, 1969, Ser. No. 824,065
Int. Cl. G06m *3/08*
U.S. Cl. 235—92cc **9 Claims**



A digital system controls the relative phase of the outputs of two dynamic counters by modulating the input train of pulses to one counter until the two counters are accurately in phase. In the system, successively releasable coarse, medium, and fine in-phase detectors, operating at successively higher frequencies, are employed to permit modulation to occur until the desired in-phase accuracy is obtained. The coarse in-phase detector first detects an in-phase condition causing release of the medium in-phase detector, which next detects an in-phase condition causing release of the fine in-phase detector which provides the final in-phase detection that terminates the modulation. During the entire modulation period, a lead-lag detector controls the direction in which the input train of pulses to the one counter is modulated.

3,578,957
SAMPLED DATA CONTROLLER

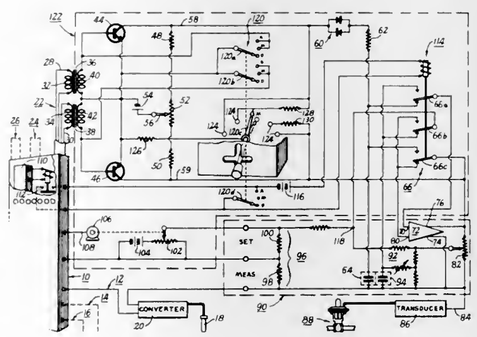
James A. Gatlin, Bowie, Md., assignor to the United States of American as represented by the Administrator of the National Aeronautics and Space Administration
Filed May 29, 1969, Ser. No. 828,984
Int. Cl. G05b *21/02, 11/10;* **G05d** *1/08*
U.S. Cl. 235—150.1 **13 Claims**



A sampled data feedback controller includes means for deriving a plurality of error signals within a single control formulation time interval. The error signals are derived by comparing the response of a plant with a reference input, constant over the interval, in a servo subtraction node. Each of the sampled errors is applied to an accumulator with a weighting factor, having a value selected on a predetermined basis, determined by the plant characteristics, to provide finite plant settling time. At the end of each control formulation interval the previous output of the accumulator is fed back to the accumulator, through a weighting factor network. The output of the accumulator at the end of each formulation interval is applied as a control input to the plant. In a specifically disclosed embodiment, the plant is a spin stabilized, attitude controlled satellite.

3,578,958
DIGITAL AND ANALOG PROCESS CONTROL APPARATUS

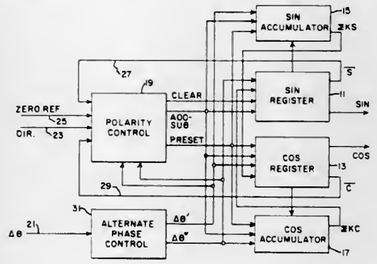
David A. Richardson, Sheldonville, Mass., assignor to The Foxboro Company, Foxboro, Mass.
Continuation of application Ser. No. 582,750, Sept. 28, 1966, now abandoned. This application July 8, 1969, Ser. No. 845,642
Int. Cl. G06j *3/00;* **G06p** *11/00*
U.S. Cl. 235—150.5 **21 Claims**



Industrial process control apparatus in which a digital computer is utilized for controlling the process, the controlled process loops of the digital computer system being provided with analog "backup" controllers. In the event of failure, control of the process condition is automatically switched to the analog controller which takes over the functions previously carried out by the digital computer.

3,578,959
DIGITAL RESOLVER WITH ALTERNATELY PHASED DIGITAL DIFFERENTIAL ANALYZERS

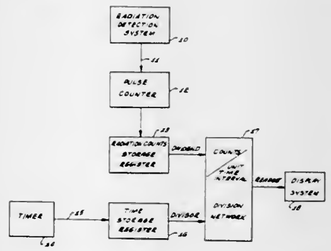
Donald W. Perkins, Dewitt, N.Y., and William E. Wickes, Manhattan Beach, Calif., assignors to General Electric Company
Filed Dec. 22, 1967, Ser. No. 692,889
Int. Cl. G06f *7/38, 15/32, 15/24*
U.S. Cl. 235—152 **8 Claims**



A resolver is described for transforming position vectors from polar to Cartesian coordinates and resolving such vectors into orthogonally related components defined by sine and cosine functions of the vector angle. This transformation is accomplished digitally in the systems as described using digital differential analyzers which iteratively sum or extrapolate the sine and cosine functions in steps each taken in response to an input pulse representing a small increment of vector angle. For purposes of optimized accuracy the sine and cosine functions are sequentially incremented by extrapolating a first of the two functions using present values of both and extrapolating the other using the extrapolated value for the first. This sequence is reversed with each input pulse, and is effected by time delay and/or anticipation means operative to differentially phase the sine and cosine extrapolations and to alternate the order or sequence in which they are computed.

3,578,960
RADIATION DETECTION SYSTEM WITH AUTOMATIC SAMPLE COUNTING RATE DETERMINATION

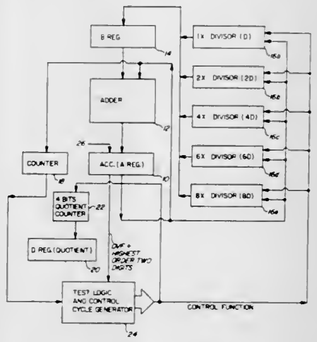
Heinz W. Georgi, San Diego, and Roy E. Nather, Solana Beach, Calif., assignors to Beckman Instruments, Inc
Filed Apr. 6, 1966, Ser. No. 540,609
Int. Cl. G06f *7/39;* **G01t** *1/16*
U.S. Cl. 235—156 **11 Claims**



A radiation detection system with automatic and continuous online computation of sample count rate is disclosed. Logic circuitry is provided by which count pulses are added to a X register and subtracted from a dividend register. A comparator circuit is provided to detect the condition of identical tally in the X register and a timer register. Upon comparison and tally coincidence of the X register with the timer register, a means to increment a quotient register is provided. Such incrementation is continued until the dividend register is reduced to zero as indicated by the negative detection circuit provided therefor. The quotient register thereby contains the number of times the timer register can be divided into the dividend register. Other circuitry is provided to transfer the counts from a sample radiation detector into the dividend register. Therefore, at the end of computation the quotient register contains the sample count rate desired. Further logic circuitry and a cycle phase counter circuit are provided to accomplish division in a time substantially less than the elapsed measurement time period. By this logic means the various registers are incremented or decremented, as the case may be, at higher decade levels in the register progressing to lower decade levels as the logic circuitry and cycle phase counter direct, thereby providing a short computational time approaching a continuous presentation of sample count rate. Automatic compensation for undesired background counts is provided by means of digital circuits for subtraction of such count from the quotient register.

3,578,961
PRE-CONDITIONED DIVISOR FOR EXPEDITE DIVISION BY SUCCESSIVE SUBTRACTION

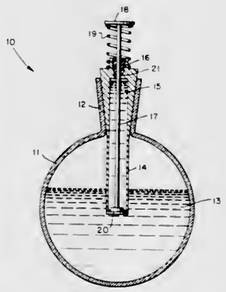
Ming-tzer Miu, Brighton, Mass., assignor to Honeywell, Inc., Minneapolis, Minn.
Filed Mar. 6, 1968, Ser. No. 710,918
Int. Cl. G06f *7/52*
U.S. Cl. 235—159 **12 Claims**



A digital divider wherein the divisor is first preconditioned to a value which renders it more easily divisible into the dividend. Once the divisor has been optimized and the value of the dividend adjusted accordingly, actual division is effected by alternately testing the high order digits of the partial remainder and subtracting multiples of the preconditioned divisor accordingly.

3,578,962
LIGHT PRODUCING DEVICE

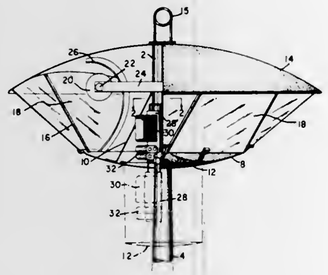
Robert L. Gerber, Ridgecrest, Calif.
Filed July 25, 1969, Ser. No. 844,810
Int. Cl. F21v *9/16;* **C09k** *1/02;* **F21k** *2/00*
U.S. Cl. 240—2.25 **2 Claims**



A chemiluminescent light-producing device comprising a glass flask containing an oxalate ester and fluorescer in a solvent and having provided in the neck of said flask a tube

holding hydrogen peroxide which when released by appropriate means reacts with the oxalate ester to produce light.

3,578,963
LIGHTING FIXTURE
Hendrik A. J. De Vos, Wenham, and Thomas Haraden, Ipswich, Mass., assignors to Sylvania Electric Products Inc.
Filed Nov. 1, 1967, Ser. No. 679,758
Int. Cl. F21v *21/00*
U.S. Cl. 240—3 **3 Claims**



A multilamp outdoor lighting luminaire in which the major components thereof are organized about a substantially cylindrical, extruded center post and the auxiliary equipment associated with each light source is mounted on a power tray slidably supported on the center post.

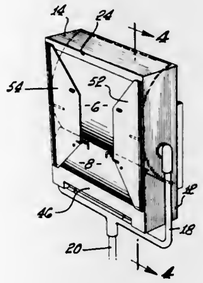
3,578,964
VEHICLE IDENTIFICATION LIGHT
Ralph H. Sherman, 217 Central St., Georgetown, Mass.
Filed Jan. 21, 1969, Ser. No. 792,633
Int. Cl. B60q *1/26*
U.S. Cl. 240—8.1 **4 Claims**

A light attachment to an automotive vehicle for identifying it rapidly in a crowded parking lot, comprises an upwardly telescopic staff carrying a lamp upon the upper end thereof. The lamp is electrically powered by conductor wires extending downwardly through the staff and connected to the automobile battery electrical power.

ERRATUM

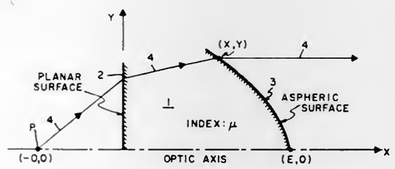
For Class 240—10.68 see:
Patent No. 3,579,269

3,578,965
FOLDABLE LUMINAIRE
Joseph N. Tawil, Woodland Hills; George R. Hartz, Canoga Park, and Edmund F. Walsh, Reseda, Calif., assignors to Berkey/Colortran Mfg., Inc., Burbank, Calif.
Filed Sept. 26, 1969, Ser. No. 861,370
Int. Cl. F21v *7/18*
U.S. Cl. 240—36 **8 Claims**



The reflector part of the luminaire is made in sections hinged to the main housing. Each section is foldable from a first extended operative position in which the sections project rearwardly away from the reflector opening to a second position in which all of the sections are located close to the plane of the opening of the reflector.

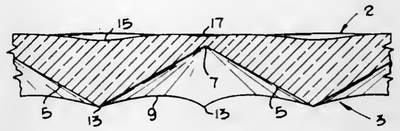
3,578,966
VEHICLE DRIVING LIGHT
Robert E. Levin, Hamilton, Mass., assignor to Sylvania Electric Products Inc.
Filed Nov. 5, 1969, Ser. No. 874,097
Int. Cl. F21v *5/04, 13/02*
U.S. Cl. 240—93 **4 Claims**



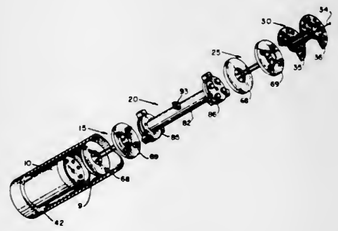
A vehicle headlight or driving light having a light source and optical condensing system producing an image at an aperture, the image being focused into a beam by the lens, which has one aspheric and one plane surface, the aspheric surface conforming to certain stated mathematical equations. The condensing system can be an ellipsoidal reflector with a light source at one focus and the image at the other. The plane surface can have a light control element on it if desired to produce small deviations in the shape of the beam.

3,578,967
PRISMATIC LIGHTING PANEL
Leo G. Stahlhut, Kirkwood, and Leo J. Horvath, St. Louis County, Mo., assignors to K-S-H, Inc., St. Louis, Mo.
Filed Aug. 27, 1969, Ser. No. 853,409
Int. Cl. F21v *5/00;* **G02b** *17/00*
U.S. Cl. 240—106 **3 Claims**

A ⅛-inch plastic lighting panel having recessed conical prisms on ¼-inch centers. The cones are one-tenth inch deep.



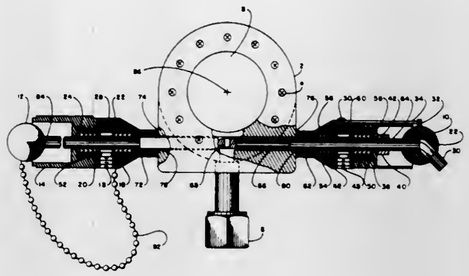
3,578,968
MOLECULAR FREQUENCY STANDARD
Helmut W. Hellwig, Oakhurst, N.J.
Filed Apr. 16, 1968, Ser. No. 721,776
Int. Cl. G01n *27/78*
U.S. Cl. 250—41.3 **2 Claims**



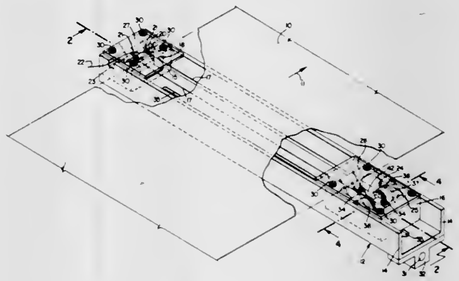
A molecular beam tube frequency standard using a barium oxide molecule of the form $Ba^{138}O^{16}$ having spinless atoms and using electrostatic state selection. The beam tube comprises a beam source including a thin-walled refractory electrically conductive oven tube containing $Ba^{138}O^{16}$. The oven tube, which is chemically inert to barium oxide, is surrounded by a thermionic electron emitter which is made negative with respect to the oven tube. Electrons emitted from the electron emitter bombard the oven tube and heat the barium oxide to a temperature at which $Ba^{138}O^{16}$ molecules are evaporated. The beam tube also comprises a cavity resonator supporting a TM mode which includes a cylinder and two end pieces provided with apertures for passage of the beam. Each of the ends of the cylinder is provided with a barbed edge; a flat surface of each end piece is pressed against a corresponding barbed edge of the cylinder by mounting means so that the barbed edges cut slightly into the surface of the end pieces. The beam tube also includes a detector comprising a heated elongated member stretched along the axis of the beam tube and arranged to intercept beam particles over a focal region extending along a portion of the length of the said member. Ions are formed in the vicinity of the elongated member and are collected by electrode means maintained negative with respect to said member.

3,578,969
SOLID SAMPLE INLET SYSTEM FOR A MASS SPECTROMETER
Walter Proskauer, San Francisco, Calif., assignor to Electronic Associates Inc., Long Branch, N.J.
Filed Nov. 25, 1968, Ser. No. 778,602
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 **8 Claims**

A system is disclosed for injecting solid material into an evacuated chamber without disturbing the pressure therein. Two rods are slidably mounted for extension into the chamber via sealed apertures at opposite ends thereof. A larger diameter rod may extend through the chamber and out the opposite ends. A smaller diameter rod carrying the solid material is interfit within the larger diameter rod. The larger rod is withdrawn as the smaller one is inserted.



3,578,970
VARIABLE WIDTH CORONA DISCHARGE APPARATUS WITH MEANS TO SHIELD OR VARY A PREDETERMINED LENGTH OF A CORONA DISCHARGE WIRE
David E. Michaud, Chicopee, and Nils L. Hakanson, West Springfield, Mass., assignors to The Plastic Coating Corporation, Hampden County, Mass.
Filed May 3, 1968, Ser. No. 726,386
Int. Cl. G03g *15/00*
U.S. Cl. 250—49.52C **13 Claims**

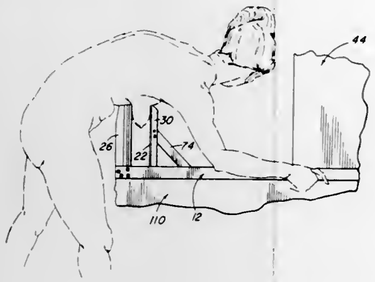


Variable width corona discharge apparatus for applying an electrostatic charge to a transverse dimension of variable width and position of the surface of strip material moving relative to the apparatus. One embodiment includes a movable shield adapted to mask the corona discharge wires along a predetermined portion of their length. Another embodiment includes a torque biased rotatable element transversely movable relative to the strip material and adapted to wind up the corona discharge wire along a predetermined portion of its length.

3,578,971
MAMMOGRAPHIC X-RAY APPARATUS AND TECHNIQUE
Harold J. Lasky, 55 E. Washington St., Evanston, Ill.
Filed Nov. 21, 1968, Ser. No. 777,923
Int. Cl. G03b *41/16*
U.S. Cl. 250—50 **5 Claims**

A method for radiographic examination of the female

breast comprising X-raying the breast under conditions of gentle compression and concurrent gravitational suspension

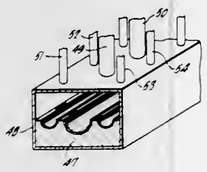


of the breast. Apparatus for carrying out the method of the invention.

ERRATUM

For Class 250—51.5 see:
Patent No. 3,579,271

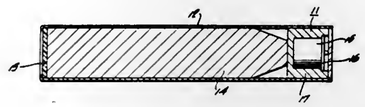
3,578,972
EXTENDED SELF-LUMINOUS LIGHT SOURCES EMPLOYING FIBER OPTICS
Harry H. Dooley; Robert J. Doda, and Arthur F. Mahon, Tucson, Ark., assignors to American Atomics Corporation, Tucson, Ark.
Continuation of application Ser. No. 552,109, May 23, 1966, now abandoned. This application Mar. 6, 1969, Ser. No. 805,041
Int. Cl. F21k *2/02*
U.S. Cl. 250—77 **15 Claims**



A radiation-excited light source having a beta-emitting radioisotope within a sealed tube. Illumination is provided by the impingement of betas upon phosphor material within the tube. "Fiber optic" light transmission media are affixed longitudinally along the exterior of the tube and feed light to a plurality of display locations. In one embodiment a thin layer of phosphor is coated over the entire inner surface of the tube. In another embodiment a thicker layer of phosphor is coated to a metal shell positioned within the tube.

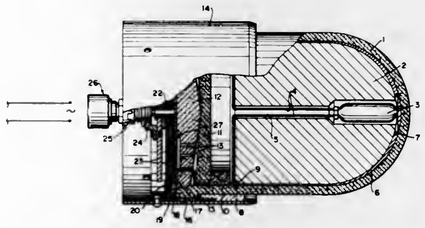
3,578,973
SELF-LUMINOUS LIGHT SOURCES EMPLOYING FIBER OPTICS
Harry H. Dooley; Robert J. Doda, and Arthur F. Mahon, Tucson, Ariz., assignors to American Atomics Corporation, Tucson, Ariz.
Continuation of application Ser. No. 552,108, May 23, 1966, now abandoned. This application Mar. 6, 1969, Ser. No. 805,042
Int. Cl. G01n *23/00*
U.S. Cl. 250—71 **21 Claims**

A self-luminous light source in which "fiber optic" light transmission media are utilized to transmit light from a radiation-excited light source to one or more light display locations at predetermined distances from the radiation-excited source. In one embodiment the radioactive material within the source is completely surrounded by radiation shielding material such as lead and the "fiber optic" media follow a



curved path within the shield. Other embodiments include apparatus for selectively presenting light of various colors and intensities to the input ends of the "fiber optic" light transmission media.

3,578,974
INFRARED SOURCE UTILIZING AN EXOTHERMIC CHEMICAL CHARGE HAVING STABLE AND NONSEGREGATING REACTION PRODUCTS
Raymond W. Thomas, Phoenix, and Abraham L. Pittinger, Scottsdale, Ariz., assignors to Talley Industries, Inc., Mesa, Ariz.
Filed Mar. 3, 1969, Ser. No. 803,587
Int. Cl. H01j *35/00*
U.S. Cl. 250—85 **13 Claims**

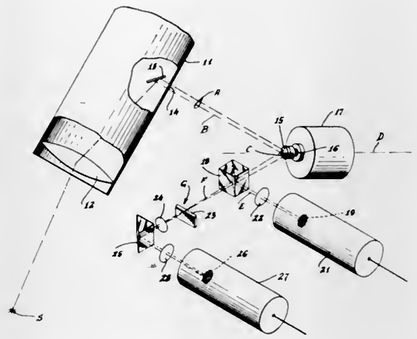


A radiant energy source is described comprising a crucible formed of a refractory material and containing an exothermic charge, the reaction products of which form a stable, nonsegregating matrix preventing large scale separation of the reaction products, thereby permitting the energy source to be mounted in a wide variety of attitudes. Cylindrical heat shields of varying lengths may be provided around the crucible permitting a variety of radiation patterns to be achieved, from a very narrow radiation cone up to slightly less than omnidirectional pattern. A valve is provided within the crucible for venting gases generated by the charge while sealing within the crucible any solid or liquid products of the reaction. A liner is disposed between the exothermic charge and the inner wall of the crucible for sealing the crucible wall against leakage of reaction products, thereby preventing deposits which would otherwise reduce the emissivity of the crucible wall.

3,578,975
APPARATUS FOR MONITORING THE GUIDANCE AND FOCUS OF TELESCOPE
Chester C. Wheeler, Altadena, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed June 14, 1968, Ser. No. 737,181
Int. Cl. G01b *9/00;* **G01j** *1/26*
U.S. Cl. 250—203 **6 Claims**

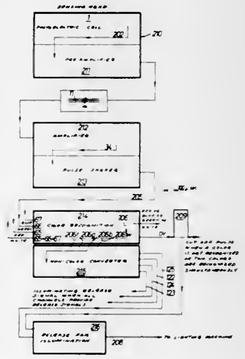
Guiding and focusing errors in a stellar telescope are detected automatically using photoelectric techniques. Light from a guidestar, collected by the telescope, is directed out of the telescope as a converging focusable beam and impinges on a high-speed chopping element. Guiding errors are detected by measuring the intensity of the emerging chopped light. An AC component in the output signal indicates an error. Focusing errors are detected by measuring the intensity

of the emerging chopped light after it strikes and is partly blocked by a knife edge positioned where the focus should occur. An AC component in the output signal indicates an



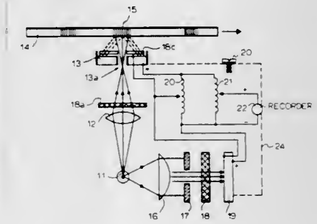
error. Both output signals are either read on meters or fed into servosystems which move portions of the telescope to compensate for the errors.

3,578,976
OPTICAL SCANNING DEVICE
Johannes Schunack, Berlin-Lichterfelde, Germany, assignor to Franz Morat G. m. b. H., Stuttgart-Vaihingen, Germany
Filed Aug. 21, 1967, Ser. No. 662,199
Claims priority, application Germany, Dec. 27, 1966, M72186
Int. Cl. G01n *21/30;* **G01j** *3/50*
U.S. Cl. 250—219 **12 Claims**



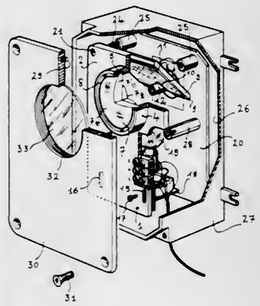
An arrangement for recording on programming tape the color pattern of, for example, fabric material. A scanning head having photosensitive apparatus scans the color pattern to be recorded on the tape, in a grid fashion. The photosensitive apparatus detects the colors on the pattern and converts the optical signals thus realized into corresponding electrical signals. After amplification, these signals from the photosensitive apparatus are converted into normalized pulses by being passed through pulse shapers. The latter provide pulses of constant amplitude and duration in the form of rectangular-shaped pulses. The latter are then applied to a color recognition circuit which provides a signal permitting recording on the programming tape when all designated colors on the pattern have been recognized. Through a systematic and orderly sequence of scanning and tape recording locations, the pattern and its color information is transferred onto the tape. This programming tape may then be used for controlling various machines, as for example, knitting or weaving machines for knitting or weaving predetermined color patterns.

3,578,977
REFLECTION TESTS HAVING PHOTOCELL WITH APERTURE
Samuel Natelson, Chicago, Ill., assignor to Rohe Scientific Corporation, Santa Ana, Calif.
Filed Feb. 19, 1968, Ser. No. 706,721
Int. Cl. G01n *21/30*
U.S. Cl. 250—219 **6 Claims**



An instrument with supporting structure for reading relative density of flat spots and the concentration of substances in that spot, comprising in combination, a detector photocell with a small aperture in its center said photocell being supported in a plane parallel to that of the flat spot to be examined and in close proximity thereto, the light sensitive surface of the photocell facing said spot; a light source and lens combination so placed in back of the photocell as to focus a light beam at the aperture in the photocell, said light beam traversing said aperture to form a spreading light beam in front of the photocell so that emission of light from the spot will strike the photocell, causing a change in current in relationship with the density of the spot, and, electrical connecting means from said photocell for connection to readout means to sense the signal from the photocell.

3,578,978
OPTICAL PROJECTOR INCLUDING PHOTO-SENSITIVE DEVICE
Bernard Laurent, Corenc-Montfleury, France, assignor to Cometa S. A. R. L., Montfleury, France
Filed May 5, 1969, Ser. No. 821,669
Int. Cl. G01p *3/68*
U.S. Cl. 250—221 **5 Claims**

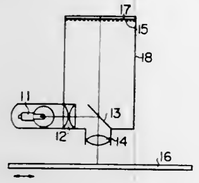


This invention relates to an optical projector for use in conjunction with a remote reflector which reflects a light beam from the projector. The projector may incorporate a photoelectric device for detecting variations in the light beam caused by movement of a body with respect to the light beam. The invention provides an optical projector comprising a light source and a lens which may be contained in a flat volume whose dimension in the direction of the optical axis is small with respect to the focal length of the lens.

3,578,979
ELECTRICAL SIGNAL GENERATING APPARATUS HAVING A SCALE GRID

Toshiji Kawaguchi; Takeo Tanaka, Tokyo-to, and Masaru Okada, Kawagoe-shi, Japan, assignors to Kabushiki Kaisha Tajima Seisakusho, Tokyo-to, Japan

Filed Dec. 18, 1968, Ser. No. 784,767
Claims priority, application Japan, Apr. 23, 1968, 43/26999
Int. Cl. G01b *11/04*; H01j *39/02*
U.S. Cl. 250—237 7 Claims

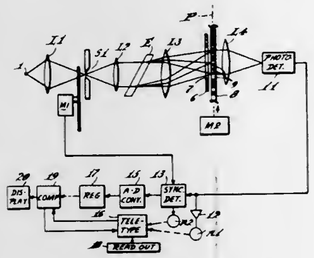


When a scale grid undergoes movement relative to index grids superposed on and adhering to respective photoelectric devices, the resulting variation in a bright-dark pattern formed by the grids is detected by the photoelectric devices and converted into electrical signals, which are processed and digitally displayed or utilized for control of machines and equipment.

3,578,980
SPECTRAL ANALYSIS USING MASKS HAVING DIFFERENT COMBINATIONS OF TRANSMITTING AND NON-TRANSMITTING PORTIONS

John A. Decker, Jr., Concord, Mass., and Martin O. Harwit, Ithaca, N.Y., assignors to Comstock & Wescott, Inc., Cambridge, Mass.

Filed June 18, 1969, Ser. No. 834,392
Int. Cl. G06k *9/00*
U.S. Cl. 250—237 14 Claims



A light spectrum is projected on a photocell through a movable mask having plural combinations of arrays of light windows and opaque areas which transmit to or mask different portions of the spectral line from the photocell. The combinations of windows and opaque areas in the several arrays are different and distributed according to a set of linearly independent equations forming a matrix. As the mask is advanced stepwise the photocell successively senses all the light transmitted from the spectrum through successively interposed arrays and generates a corresponding group of values with an inverse of the mask matrix so as to derive a series of values representing the distribution of energy along the spectrum. The mask thus analyzes and encodes the spectral energy distribution.

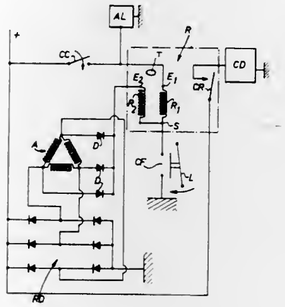
ERRATUM

For Class 250—221 see:
Patent No. 3,579,047

3,578,981
ENGINE STARTER CONTROL CIRCUITS

Claude Edmond Lombard; Jean Henri Maurice, and Jean Piret, Billancourt, France, assignors to Regie National Des Usines Renault, Billancourt (Hauts de Seine), France and Automobiles Peugeot, Paris, France

Filed Dec. 24, 1968, Ser. No. 786,660
Claims priority, application France, Jan. 19, 1968, 136767
Int. Cl. F02n *11/08*
U.S. Cl. 290—38 2 Claims



A starter motor control circuit contains a relay having two windings associated in opposed relationship, the first winding being energized through the medium of the ignition key switch and the second winding from the alternator through a special group of rectifying diodes of which the number is proportional to that of the phases of said alternator and the capacity consistent with the current drawn by the winding of the starter relay supplied therethrough.

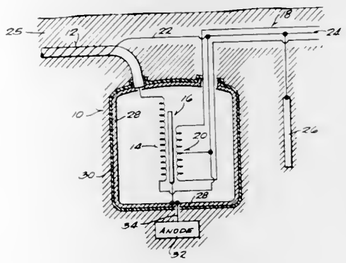
ERRATUM

For Class 307—10 see:
Patent No. 3,579,285

3,578,982
CORROSION PROTECTION FOR METAL ENCLOSURES FOR ELECTRICAL EQUIPMENT

Rolland D. Nelson, Waukesha, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed July 30, 1968, Ser. No. 748,798
Int. Cl. H01b *7/28*
U.S. Cl. 307—95 6 Claims

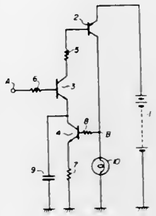


Disclosed herein is a metallic enclosure for electrical equipment used in an underground electrical distribution system which is isolated from the electrical distribution system ground and made cathodic by connecting the enclosure to a consumable anode buried in the ground in close proximity to the metallic enclosure.

3,578,983
TRANSISTOR-PROTECTING CIRCUIT

Yoshihiko Kondo, Nagoya, Japan, assignor to Nippon Denso Company Limited, Kariya-shi, Japan

Filed June 5, 1969, Ser. No. 830,646
Claims priority, application Japan, June 25, 1968, 43/44065
Int. Cl. H02h *7/20*
U.S. Cl. 307—202 2 Claims



A transistor-protecting circuit comprising a load circuit including a source, a switching transistor and a load. A resistor, a second transistor for receiving an input signal and a capacitor are connected in series between the base of the first transistor and the interconnection of the load and the source. A third transistor and a resistor are further connected in series between the two plates of the capacitor to form a discharging circuit. The third transistor has its base connected to the interconnection of the load and the first transistor whereby when the load is short circuited to keep it in the cutoff state.

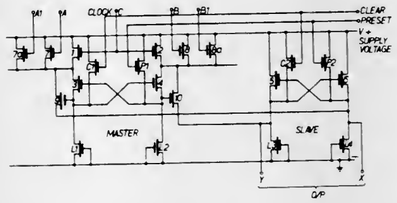
ERRATA

For Classes 307—25, 307—218, 307—221, 307—228 see:
Patent Nos. 3,579,272 thru 3,579,275

3,578,984
MASTER/SLAVE SWITCHING CIRCUIT EMPLOYING INSULATED-GATE FIELD-EFFECT TRANSISTORS

John E. Ryley, Ilford, England, assignor to The Plessey Company, Limited, Ilford, England

Filed Dec. 9, 1968, Ser. No. 782,239
Claims priority, application Great Britain, Dec. 14, 1967, 56940/67
Int. Cl. G11c *19/00*; H03k *23/08*
U.S. Cl. 307—221 11 Claims

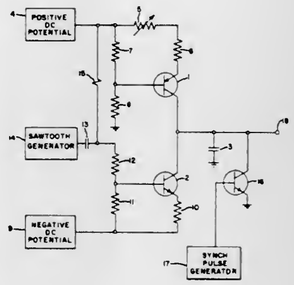


A master/slave switching circuit comprising a master bistable defined by a pair of insulated gate field-effect transistors having associated with them load field-effect transistors and a slave bistable switch defined by a further pair of field-effect transistors also having insulated gate field-effect transistor loads connected there to the master bistable and the slave bistable being interconnected by insulated gate field-effect transistors such that if the state of the master bistable is changed in response to a clock pulse applied to a terminal the state of the slave bistable is also changed, the response of the master bistable to input clock pulses being controlled in accordance with the state of input signals applied to terminals.

3,578,985
PARABOLIC WAVEFORM GENERATING CIRCUIT

Alvin W. Edson, Baldwinsville, N.Y., assignor to General Electric Company

Filed Feb. 3, 1969, Ser. No. 795,859
Int. Cl. G06g *7/12*
U.S. Cl. 307—229 5 Claims

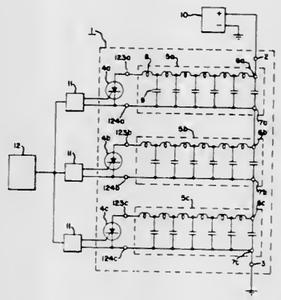


A parabolic generator circuit for generating a smooth parabolic waveform that is stable and free of distortion, and which circuit is of a relatively simple circuit configuration. The circuit includes a constant current source and a sawtooth current source in combination with a capacitor to which is applied current equal to the difference between the fixed and sawtooth currents, the capacitor integrating the applied current so as to generate said parabolic voltage.

3,578,986
STACKED PULSE-FORMING NETWORK SWITCHING CIRCUIT

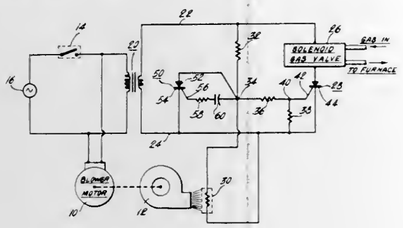
August L. McGuffin, Clinton, and Ralph M. Philip, Whitesboro, N.Y., assignors to General Electric Company

Filed Aug. 21, 1968, Ser. No. 754,378
Int. Cl. H03k *17/00, 1/00*
U.S. Cl. 307—246 8 Claims



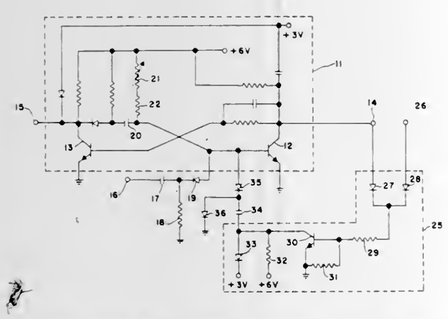
A multiple element switching circuit, including a plurality of controlled unilateral conductive elements such as silicon controlled rectifiers, for connection across a charged pulse-generating circuit and a load in a pulse generator. The switching circuit includes a plurality of SCRs which are each connected in shunt across one of a plurality of serially connected pulse-forming networks. When the SCRs are gated, each pulse-forming network is short circuited. The short-circuited pulse-forming networks provide a step voltage to switch the pulse voltage connected thereacross while providing isolation between each of the conductive elements.

3,578,987
RESISTANCE-SENSING SYSTEM WITH FAIL-SAFE CIRCUIT
Douglas W. De Werth, Cleveland, and Earl J. Weber, Bay Village, Ohio, assignors to Dover Corporation, Louisville, Ky.
Filed Dec. 9, 1968, Ser. No. 782,390
Int. Cl. H03k *17/00*
U.S. Cl. 307—252Q **7 Claims**



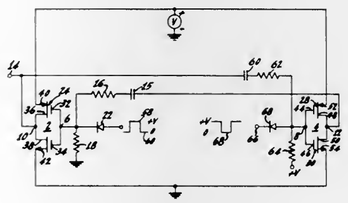
A control circuit suitable for use in a forced-draft gas-fired heating system permits a solenoid gas valve to be turned on only if a blower is operating. The solenoid of the gas valve is controlled by a silicon-controlled rectifier (SCR) which receives its gate signal from a thermistor circuit. The blower, when operating, blows air over the thermistor to limit the extent to which it heats up in response to current passed through it, thereby maintaining the thermistor resistance high enough to operate the SCR and the gas valve so long as the blower operates properly. If the blower does not operate properly, the thermistor warms up further, its resistance decreases markedly, and the signal which it develops and applies to the gate of the SCR becomes too weak to turn on the SCR and the gas valve. To prevent operation of the gas valve should the thermistor become open-circuited, there is employed a second silicon-controlled rectifier circuit comprising a second SCR having anode and cathode electrodes in shunt with the thermistor and having a gate electrode which derives its voltage from across the thermistor by way of a capacitor having a predetermined minimum value sufficient to cause the second SCR to turn on before the first SCR should the thermistor become open-circuited. When the second SCR is thus turned on, the first SCR cannot be turned on, and the solenoid gas valve is thereby prevented from being turned on if the thermistor becomes open-circuited.

3,578,988
DIGITAL PULSE WIDTH SELECTION CIRCUIT
Daniel F. Slowikowski, Newport News, Va.
Filed Nov. 7, 1969, Ser. No. 874,732
The United States of America, as represented by the administrator of the National Aeronautics and Space Administration
Int. Cl. H03k *1/18*
U.S. Cl. 307—265 **5 Claims**



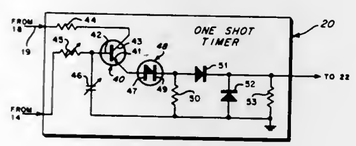
A device that will produce different width pulses. The width of the pulse produced at any given time is selected by a digital input. The digital input selects one of two or more possible timing circuits for a one-shot multivibrator. Hence, the digital input selects one of two or more possible pulse widths capable of being produced by the multivibrator.

3,578,989
PULSE WIDTH STABILIZED MONOSTABLE MULTIVIBRATOR
Robert Charles Heuner, Bound Brook, N.J., assignor to RCA Corporation
Filed June 17, 1969, Ser. No. 834,019
Int. Cl. H03k *3/26*
U.S. Cl. 307—273 **7 Claims**



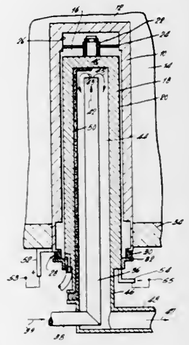
A monostable multivibrator comprising two cross-coupled inverters having substantially identical threshold voltage levels. Each cross-coupled path includes a charge storage means and there is also included a discharge path for each charge storage means. In response to complementary input signals to the inverters, the multivibrator switches from a first state to a second state and, in response to the first of either charge storage means discharging to the threshold voltage level, the multivibrator switches back to its first state.

3,578,990
PULSE GENERATOR TIMING CIRCUITS
Henry Naubereit, Brown's Mill, N.J.
Filed Apr. 2, 1969, Ser. No. 812,937
Int. Cl. H03k *17/28*
U.S. Cl. 307—293 **5 Claims**



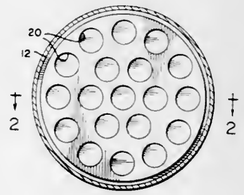
A detector provides a signal for switching on the power supply of a proximately positioned transmitter upon the detection of desired information. A signal representative of the desired information is transmitted and, at predetermined times thereafter, coded signature signals are produced for transmission, these latter signals being supplied by a code generator upon the receipt thereto of pulses from a one-shot and/or repetitive interval timer. The one-shot timer at a predetermined period of time after receipt of the switching signal provides a single pulse to the code generator. The repetitive interval timer provides recurring pulses to the code generator at predetermined intervals of time after receipt of the switching signal. The system consumes no power in the standby mode.

3,578,991
THERMIONIC CONVERTER WITH CONCENTRIC COLLECTOR AND EMITTER
Franz Gross, Neckargemund, and Rudolf Krapf, Leimen, Germany, assignors to Brown, Boveri & Cie A. G., Kallsladter Str., Germany
Filed Sept. 25, 1967, Ser. No. 670,187
Claims priority, application Germany, Sept. 27, 1966, B89094
Int. Cl. H01j *45/00*
U.S. Cl. 310—4 **2 Claims**



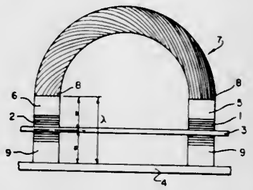
A thermionic converter for converting heat energy directly into electrical energy, the heat being derived from the use in the device of nuclear fuel. In the device the emitter is so disposed as to extend into the mass of nuclear fuel, and has a chamber formed therewithin in which there is disposed the collector electrode element, but spaced from the emitter so as to form a sealed interspace chamber which is filled with a gaseous vapor such as caesium vapor. Electric terminals are provided for carrying outwardly to an electric line the electrical energy from the coupled emitter and collector, and coolant means are provided for conducting coolant fluid into the interior of the collector.

3,578,992
CAVITY EMITTER FOR THERMIONIC CONVERTER
T. O. Paine, Deputy Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Katsunori Shimada, Pasadena, Calif.
Filed Oct. 17, 1968, Ser. No. 768,470
Int. Cl. H01j *45/00*
U.S. Cl. 310—4 **7 Claims**



A thermionic cesium diode incorporating a cavity emitter is disclosed. The emitter defines a plurality of relatively shallow cavities extending inwardly from the surface thereof which faces the interelectrode gap. The depths of the cavities are comparable with the electron-neutral mean-free path and the ratios of the depths of the cavities to their diameters are large enough to neutralize electron space charge from occurring thereat.

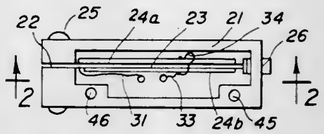
3,578,993
VIBRATORY ENERGY GENERATORS
Leslie Tremaine Russell, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Ontario, Canada
Filed Feb. 16, 1970, Ser. No. 11,614
Continuation-in-part of Ser. No. 797,492, Feb. 7, 1969.
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.3 **4 Claims**



Energy emitted in a rearward direction from vibratory energy transducers is conveyed from the rear end of a transducer to another by coupling members of equal length joining similar portions of the rear ends of the transducers.

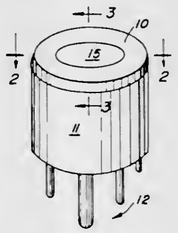
In the preferred embodiment the coupling members are of steel rods and are stranded in the form of steel rope without a central crown rod.

3,578,994
PIEZOELECTRIC CLAMPED-FREE BEAM TYPE TRANSDUCER
Frank Massa, Cohasset, Mass., assignor to Massa Division, Dynamics Corporation of America, Hingham, Mass.
Filed Oct. 22, 1969, Ser. No. 868,332
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.6 **7 Claims**



A transducer cartridge carries a miniature video recording head on a tiny vibrating platform. The platform is at the end of a piezoelectric reed which undertakes mechanical excursions responsive to an electrical signal. Various designs are illustrated which have been built and found to be satisfactory for use with a home video tape recorder.

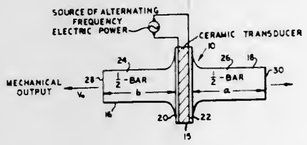
3,578,995
ELECTROACOUSTIC TRANSDUCERS OF THE BILAMINAR FLEXURAL VIBRATING TYPE
Frank Massa, Cohasset, Mass., assignor to Massa Division Dynamics Corporation of America, Hingham, Mass.
Filed Sept. 22, 1969, Ser. No. 859,677
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.8 **7 Claims**



A button transducer comprises a metallic diaphragm concentrically bonded to a piezoelectric ceramic disc. A plurality of types of annular housings are provided for clamping and

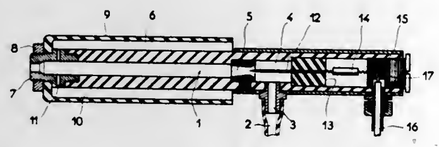
terminating the periphery of the diaphragm, each housing type having a central opening with a different diameter therein. The bonded diaphragm-disc assemblies are measured for resonant frequency, and the housing type is selected to tune the bonded assembly to have a predetermined resonant frequency.

3,578,996
ULTRASONIC MOTOR
Lewis Balamuth, New York, N.Y., assignor to Ultrasonic Systems, Inc., Farmingdale, N.Y.
Filed Jan. 7, 1970, Ser. No. 1,125
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.7 **32 Claims**



An ultrasonic motor having a transducer confined at or near a nodal region of vibration sandwiched between two flanged sections, each flanged section consisting of an elongated member whose average cross section is substantially less than the cross section of the transducer, and the transducer is rigidly coupled to the flanged sections.

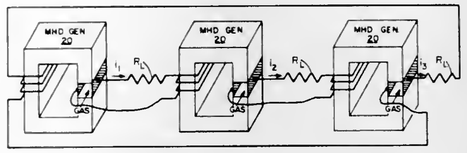
3,578,997
ELECTRIC GENERATORS
Noel Felici, Grenoble, France, assignor to Tunzini-Sames, Grenoble, France
Filed Oct. 15, 1969, Ser. No. 866,689
Claims priority, application France, Oct. 21, 1968, 170,760
Int. Cl. H02n *3/00*
U.S. Cl. 310—10 **9 Claims**



This invention relates to electric generators employing a gaseous fluid, such as air, which is caused to flow through a passage at high speed. The gaseous fluid is ionized by ionizing means comprising a needle electrode and a counter electrode formed by a convergent-divergent wall portion at the upstream end of the passage, the downstream portion of the passage being formed by an electrically insulating tube. According to this invention means are provided to avoid condensation forming on the outer surface of the insulating tube. The anticondensation means may comprise either thermal insulation, around the outer surface of the insulating tube; or means for heating said outer surface, or yet again means inducing a flow of a gaseous fluid over said outer surface.

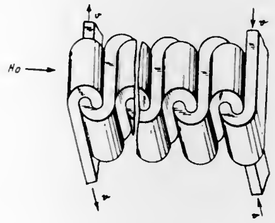
3,578,998
POLYPHASE ALTERNATING CURRENT GENERATOR
William C. Euerle, Milton, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Nov. 5, 1968, Ser. No. 773,423
Int. Cl. H02n *4/02*
U.S. Cl. 310—11 **8 Claims**

A polyphase alternating current electrical power generator is obtained by interconnecting N direct current power generators. N is the number of phases to be generated and must be greater than or equal to three. The output of one generator is connected to the input of another generator either serially through a load or in parallel with a load. For rotating or magnetohydrodynamic generators, the output of one generator is connected to the field winding of another generator in a cascaded connection of generators forming a



closed loop. For electrostatic generators the input terminals and output terminals generally have a common ground terminal which restricts the permissible values of N to odd integers. The phasing of the interconnections is such that if the loop is opened at any point, a voltage transfer characteristic corresponding to positive feedback is obtained with a gain of unity and zero phase shift.

3,578,999
MAGNETOHYDRODYNAMIC ENERGY CONVERSION PROCESS
Max Steenbeck, and Fritz Krause, Jena, Germany, assignors to Deutsche Akademie Der Wissenschaften Zu Berlin, Berlin-Adlershof, Germany
Filed July 23, 1969, Ser. No. 843,919
Int. Cl. H02k *45/00;* **H02m** *4/02*
U.S. Cl. 310—11 **10 Claims**

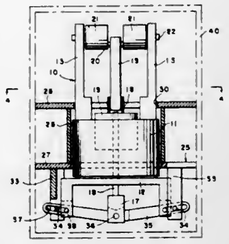


A process for magnetohydrodynamic conversion of mechanical energy in an electrically conducting fluid flowing through a magnetic excitation field. A nonmirror symmetrical flow is applied to the fluid and a main magnetic field is established from the current flow arising from the electromotive force generated parallel to the excitation field. The electromotive force is generated as a result of the alpha-effect. The electrically conducting fluid serves as a conductor for the current flow and, at the same time, removes the heat generated during the process.

3,579,000
SUSPENDED MOTOR VIBRATORY APPARATUS
Joseph W. Mathews, 3762 Swansea Drive, Mobile, Ala.
Filed Nov. 19, 1969, Ser. No. 877,933
Int. Cl. H02k *33/00*
U.S. Cl. 310—15 **8 Claims**

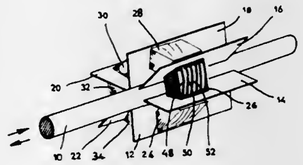
Apparatus for mounting within a case which represents the vibrating load, includes an electric motor assembly and a suspension bracket to which the case is rigidly attached. The motor includes a relatively heavy housing which defines a magnetic stator structure, and a relatively light reciprocating armature structure. The armature oscillates lever arms

pivotally connected to the motor stator; with the lever arms being coupled to the suspension bracket to effect relative



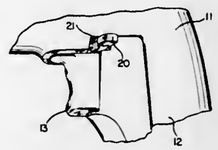
reciprocating movement between the suspension bracket and motor stator.

3,579,001
LINEAR MOTOR HAVING RADIAL ARMATURE PLATES
Yves F. Pelenc, La Tronche, France, assignor to Merlin Gerin, Societe Anonyme, Grenoble, France
Filed Oct. 16, 1969, Ser. No. 866,911
Claims priority, application France, Nov. 7, 1968, 173,022
Int. Cl. H02k *41/02*
U.S. Cl. 310—13 **8 Claims**



Compact linear motor of high thrust having an annular magnetic field structure with a plurality of radially directed air gaps in which extend armature plates of the motor. The armature plates are subjected to the magnetic flux produced by the field structure resulting in axially directed forces which displace the armature with respect to the field structure.

3,579,002
REVERSING SWITCH FOR POWER TOOLS
John L. Wickham, Glen Arm, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.
Filed Mar. 31, 1970, Ser. No. 24,308
Int. Cl. H02k *7/14;* **H01h** *9/06*
U.S. Cl. 310—50 **8 Claims**

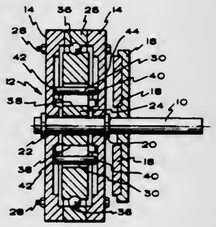


A portable power tool including a reversible electric motor, a housing having a handle adapted to be grasped by an operator, and a trigger switch adjacent the handle to be grasped by the operator's finger for energizing the motor. The tool also includes a reversing switch. The operating member for the reversing switch comprises a T-shaped operating lever located above the trigger for convenient engagement by the operator. The base portion of the T-bar is connected through a pivot mounting to the reversing switch whereby rotation thereof through an arc causes operation of the switch. The arm portions of the T-bar extend toward the opposite sides of the tool and protrude slightly through apertures in the housing so that, upon engagement of one or the other by the operator's hand, the reversing switch is moved between its forward and reverse positions.

ERRATA

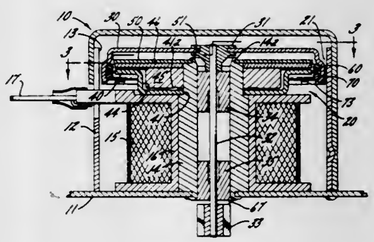
For Classes 310—82, 310—156 see:
Patent Nos. 3,579,276 and 3,579,277

3,579,003
MAGNETIC BRAKING SYSTEM
Robert C. Gray, 280 Clifford St., Blackfoot, Idaho 83221
Filed July 31, 1969, Ser. No. 846,471
Int. Cl. H02k *49/10*
U.S. Cl. 310—93 **10 Claims**



A magnetic braking system for braking the motion of a moving member including first magnet means mounted on the moving member, a support frame positioned proximate the moving member, second magnet means having a polarity opposite the polarity of the first magnet means secured to the support frame, and positioning means for moving the second magnet means on the support frame to a position proximate the first magnet means wherein the magnetic flux between the first and second magnet means brakes the motion of the moving member.

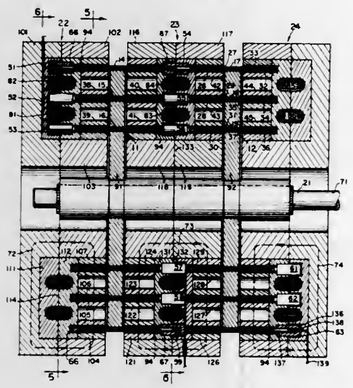
3,579,004
SYNCHRONOUS MOTOR FOR CLOCKS AND THE LIKE
Alan E. Patrick, Statesville, and Kenneth E. Kern, Charlotte, N.C., assignors to General Time Corporation, Stamford, Conn.
Filed Oct. 16, 1969, Ser. No. 866,970
Int. Cl. H02k *21/00*
U.S. Cl. 310—164 **8 Claims**



A synchronous AC motor for driving clocks or the like having pole structure for producing shaded and unshaded flux in an annular airgap, the airgap being occupied by a rotor having adjacent loops of material of unlike magnetic retentivity, one loop having sufficiently low coercive magnetic intensity to serve, by induction, to start the rotor and bring it up to speed and the second loop having a sufficiently high coercive magnetic intensity as to form durable spots of permanent magnetism for providing torque at synchronous rotor speed. A thick shading ring, to achieve a high shading cur-

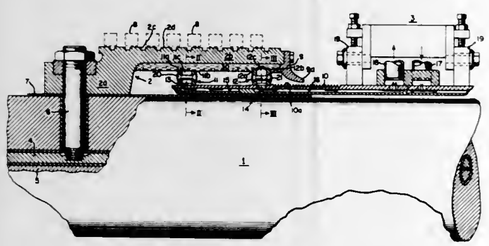
rent, is accommodated by a special pole configuration to achieve compact spacing between the shaded and unshaded poles. The first ring is positioned to be subject to the major flux under starting conditions.

3,579,005
HOMOPOLAR DYNAMOELECTRIC APPARATUS
Bruce P. Noble, 2748 Grande Vista Ave., Oakland, Calif.
Filed July 25, 1969, Ser. No. 844,845
Int. Cl. H02k *31/00*
U.S. Cl. 310—178 **15 Claims**



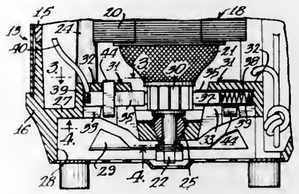
A homopolar dynamoelectric apparatus wherein a field structure is formed with alternately spaced segments of high and low magnetic permeability adjacent a rotating conductive armature for inhibiting undesirable rotation of magnetic flux therewith. The armature is constructed with a plurality of individual sections each adapted to generate a separate voltage potential which may be electrically added to the outputs of each of the other armature sections to produce a resultant output voltage substantially higher than the low output potentials heretofore characteristic of homopolar devices.

3,579,006
LIQUID COOLED COLLECTOR RINGS FOR DYNAMOELECTRIC MACHINE
Fred H. Kindl, Schenectady, and Sterling C. Barton, Scotia, N.Y., assignors to General Electric Company
Filed Nov. 21, 1969, Ser. No. 878,746
Int. Cl. H02k *9/28, 39/00*
U.S. Cl. 310—227 **5 Claims**



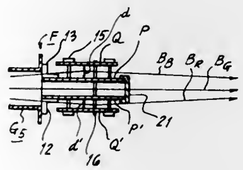
In a dynamoelectric machine of the type having brushes transmitting current to a shaft-mounted collector ring, the improvement consists of a liquid dam on one end of the overhanging ring and means to supply liquid into the rotating cavity and collect liquid from the cavity so as to cool the ring and increase the current-transmitting capacity of the brushes.

3,579,007
COMMUTATOR BRUSH STRUCTURE FOR ELECTRIC MOTOR
John Walter, Evergreen Park, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Oct. 30, 1969, Ser. No. 872,606
Int. Cl. H02k *5/14*
U.S. Cl. 310—242 **7 Claims**



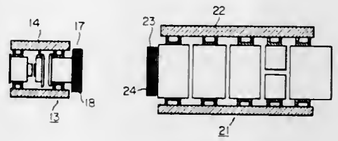
An electric motor having a supporting frame within which the commutator brushes are supported. The brushes are received in channel-shaped recesses and are retained therein by spring clips which snap into engagement with the supporting frame.

3,579,008
COLOR TUBE HAVING ASYMETRICAL ELECTROSTATIC CONVERGENCE CORRECTION SYSTEM
Senri Miyaoka, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Apr. 10, 1969, Ser. No. 815,050
Claims priority, application Japan, Apr. 13, 1968, 43/24621
Int. Cl. H01j *3/06, 25/50, 31/20*
U.S. Cl. 313—79 **4 Claims**



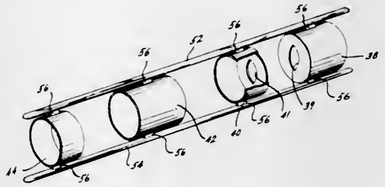
In a single-gun, plural-beam color picture tube in which two beams emerge from a focusing lens along paths that diverge from a central beam emerging along the optical axis of the lens by which all of the beams are focused on the color screen, and the divergent beams are deflected to converge with the central beam by passage through respective electrical fields established between first spaced plates, at opposite sides of the central beam path, and second plates spaced outwardly from the first plates; such plates are disposed closely adjacent to the main deflection yoke by which the beams are made to scan the screen so that the length of the tube can be minimized, and the misconvergence of the beams that may result from the magnetic field produced between the first plates by reason of a current flow induced in the first plates by flux change of the magnetic field of the main deflection yoke is corrected by providing the second plates with different dimensional relationships to the first plates, for example, different distances from the first plates or different distances along the first plates, so that the deflecting effects of the electrical fields are correspondingly different.

3,579,009
ELECTRON GUN ASSEMBLY INCLUDING TWO PART THREADED ELECTRODE
Tsutomu Nishino; Kokiti Kinoshita, and Haruo Maeda, Kadoma, Osaka, Japan, assignors to Matsushita Electric Industrial Company Limited, Kadoma, Osaka, Japan
Filed July 3, 1969, Ser. No. 839,015
Claims priority, application Japan, July 10, 1968, 43-49268
Int. Cl. H01j *29/46, 1/00, 8/50*
U.S. Cl. 313—83 **1 Claim**



An electron gun assembly for a cathode-ray tube having a removable cathode-grid assembly which has a plurality of stem leads connected with the respective electrodes and led out to the outside at the stem and which is supported by multihold glass bars, and an anode and focusing electrode assembly which has a plurality of side leads connected with the respective electrodes and led to the outside from the side and which is supported by multihold glass bars.

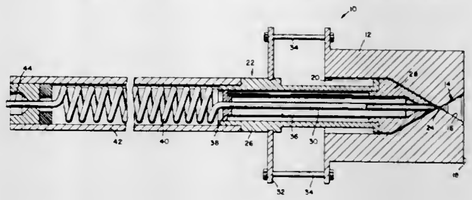
3,579,010
ELONGATED APERTURE ELECTRON GUN STRUCTURE FOR FLAT CATHODE RAY TUBE
Robert C. Jones, Elkins Park, Pa., assignor to Philco-Ford Corporation, Philadelphia, Pa.
Filed Oct. 31, 1968, Ser. No. 772,232
Int. Cl. H01j *1/46, 29/46*
U.S. Cl. 313—86 **9 Claims**



An electron gun for a flat cathode-ray tube wherein the control electrode and the screen electrode of the gun each have an elliptical aperture therein, and a flat cathode-ray tube employing such a gun. The major axes of the two elliptical apertures lie in a common plane which is oriented with respect to the faceplate of the tube so that an electron beam emitted by the cathode of the gun produces a substantially circular spot on said faceplate.

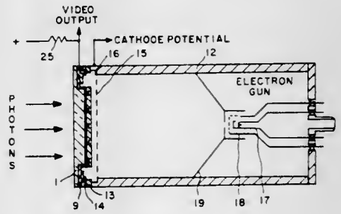
3,579,011
LIQUID METAL CATHODE WITH SINGLE CAPILLARY FLOW IMPEDANCE
Julius Hyman, Jr., Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Jan. 8, 1969, Ser. No. 789,768
Int. Cl. H01j *1/06, 1/10, 13/10*
U.S. Cl. 313—29 **6 Claims**

The liquid metal cathode is employed as a cathodic electron source in arc discharges. A small liquid metal pool serves as the arcing material, and when it is kept small, improved electron-to-atom emission ratios are obtained, as well as gravity independence. However, when such a small pool is employed, feed to the pool must be free of feed rate perturbations. Otherwise, an instability in the level of the mercury in the pool results. The present invention obtains feed rate stability by providing a feed passage with a diameter which is everywhere larger than that of the feed channel which finally



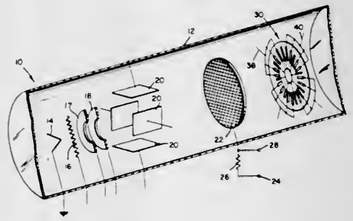
discharges to the pool. Feed flow impedance is provided by an elongated capillary feed channel.

3,579,012
IMAGING DEVICE WITH COMBINED THIN MONOCRYSTALLINE SEMICONDUCTIVE TARGET-WINDOW ASSEMBLY
Walter K. Zwicker, Scarborough, N.Y., and Alfred Milch, Teaneck, N.J., assignors to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 16, 1968, Ser. No. 767,958
Int. Cl. H01j *31/26;* **H01l** *3/12*
U.S. Cl. 313—65 **10 Claims**



An imaging device, especially a vidicon-type camera tube, in which the active target layer is an ultrathin monocrystalline semiconductor grown epitaxially on a thicker supporting monocrystalline substrate which is transparent to the imaging radiation and thus serves as a window for the radiation to enter the tube to be detected by the semiconductor.

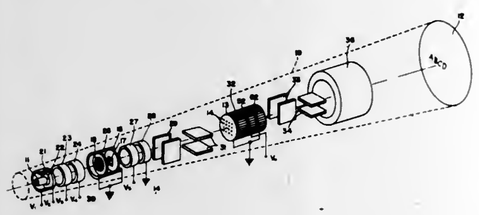
3,579,013
CATHODE RAY TUBE HAVING RADIALLY DIRECTED COMMUTATOR ELEMENTS
Elvin E. Herman, Pacific Palisades, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Jan. 8, 1969, Ser. No. 789,731
Int. Cl. H01j *31/06, 29/78*
U.S. Cl. 313—73 **2 Claims**



A focused electron beam is circularly deflected. It is directed at a commutator target and passes through a positive collector mesh. The target comprises a plurality of separate, conductive spokes. Alternate spokes are connected together and serve as a shield electrode, which is held slightly

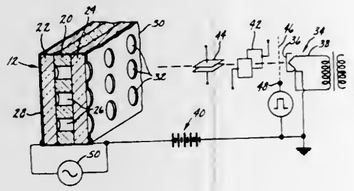
positive with respect to the cathode. The remaining alternating spokes are grouped with three to five of the spokes being connected together to form an input channel. Input channel level ranges are typically from −5 volts to zero, so that when a group is more negative, the electron beam is prevented from landing on the shield electrode, and is returned to the collector grid or mesh. When an input is near zero volts, a large percentage of the electron beam lands on the shield electrode. Thus, between these values, electron beam current returning to the collector mesh is modulated by the input signal levels applied to the various spoke groups. In this manner the voltage levels on the different sets of input spokes are commutated as the electron beam is circularly deflected. The commutated signal can be read as collector mesh current.

3,579,014
SHAPED BEAM TUBE HAVING FINE MESH CLOSELY ADJACENT SUBSTANTIALLY RECTANGULAR TRIM APERTURE
Charles R. Corpew, La Mesa, Calif., assignor to Stromberg Datagraphics Inc., San Diego, Calif.
Filed Aug. 19, 1968, Ser. No. 753,601
Int. Cl. H01j *29/56, 29/70, 29/06*
U.S. Cl. 313—86 **5 Claims**



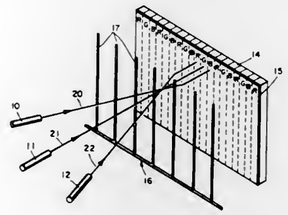
A shaped beam tube is described wherein a mesh is provided adjacent a trim aperture to diffuse the beam (which is utilized to flood the shaping aperture) and to produce a substantially uniform intensity over the cross section of the beam.

3,579,015
ELECTRON BEAM ADDRESSED PLASMA DISPLAY PANEL
Robert O. Gregory, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Mar. 18, 1969, Ser. No. 808,195
Int. Cl. H01j *29/10;* **H05b** *33/02*
U.S. Cl. 313—89 **8 Claims**



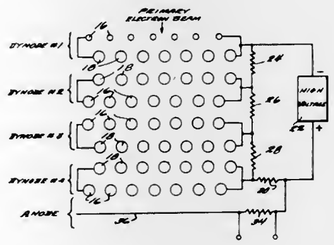
A combination display and storage tube of the type having gas-filled cells sandwiched between flat insulating sheets. One of the two electrodes for applying the sustaining voltage to the gas-filled cells is provided with apertures so that an electron beam may be used to initiate or extinguish the discharge of selected cells.

3,579,016
POSTDEFLECTION TUBE WITH ALL RARE EARTH PHOSPHORS
Frank C. Palilla, Maspeth, N.Y., assignor to General Telephone & Electronics Laboratories Incorporated
Filed Oct. 23, 1967, Ser. No. 677,198
Int. Cl. H01j *29/32, 31/20*
U.S. Cl. 313—92 **2 Claims**



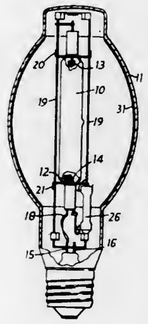
A color cathode-ray tube of the postdeflection-focusing type (PDF) wherein the phosphor screen exhibits a linear change in brightness with changes in electron beam current density over the entire operating range of the tube. The preferred phosphor screen employs trivalent europium activated yttrium vanadate as the red-emitting phosphor, trivalent terbium activated yttrium phosphate as the green-emitting phosphor and divalent europium activated strontium chlorophosphate as the blue-emitting phosphor. The disclosed screen results in a PDF tube which exhibits a linear increase in brightness, improved contrast and maintenance of color balance for all values of beam current.

3,579,017
HARP ELECTRON MULTIPLIER
Marvin L. Vestal, Baltimore, Md., assignor to Scientific Research Instruments Corporation, Baltimore, Md.
Filed June 17, 1968, Ser. No. 737,490
Int. Cl. H01j *43/00*
U.S. Cl. 313—105 **12 Claims**



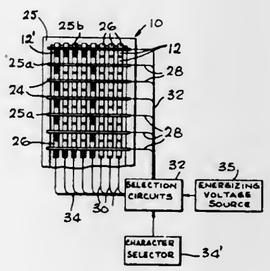
An electron multiplier having a plurality of dynodes wherein each dynode includes two wire layers located in staggered relationship with one another and wherein each of the dynodes is located with a first one of its wire layers aligned with the immediately adjacent wire layer of an immediately preceding dynode and with its second wire layer aligned with the immediately adjacent wire layer of an immediately following dynode. The wires in each layer of each of the dynodes are spaced so that the open space between them is less than the diameter of the wires, with the exception of the first wire layer in the first dynode wherein the wires may be of a noncircular cross section or of a smaller diameter and wherein they are spaced apart by a distance greater than the diameters thereof.

3,579,018
LUMINESCENT MATERIALS
Peter Whitten Ranby, and David Richard Palowkar, London, England, assignors to British Lighting Industries Limited, London, England
Filed Apr. 18, 1969, Ser. No. 817,367
Claims priority, application Great Britain, Apr. 30, 1968. 20,505/68
Int. Cl. H01j *63/04*
U.S. Cl. 313—109 **4 Claims**



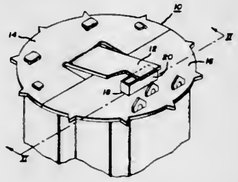
New phosphors, emitting a red fluorescence and suitable for use in high-pressure mercury vapor lamps, consist of zinc aluminate activated by chromium in which some of the alumina is replaced by boron oxide.

3,579,019
LIGHT CELL MATRIX STRUCTURE
Alfred D. Scarbrough, Northridge, Calif., assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.
Filed Apr. 1, 1969, Ser. No. 812,256
Int. Cl. H01j *5/16*
U.S. Cl. 313—109.5 **13 Claims**



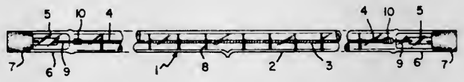
A light cell structure for supporting and conducting energizing signals to a rectangular matrix of ionizable gas-filled light cells. The structure is constructed and arranged so as to permit the emitted light from an energized cell to be directly viewed without first passing through an electrode. Each light cell is typically of the general shape of a rectangular parallelopiped. One pair of opposed surfaces of each parallelopiped light cell serve as energizing surfaces, and one of the remaining surfaces is a light transmitting surface which serves as a viewing surface. The light cells are supported and selectively energized by a row-column arrangement of conductive members to which the light cells are affixed by their energizing surfaces. The row conductive members are typically conductive strips, while the column conductive members are typically conductive strips having uniformly spaced upstanding tabs provided along the length thereof. Each light cell has one of its energizing surfaces affixed to a respective row strip at a respective one of a plurality of uniformly spaced positions along the length of the row, and the other of its energizing surfaces affixed to a respective one of the upstanding tabs of a respective column strip. Provision is also made for enhancing light emitted from the viewing surface of each parallelopiped light cell by using the remaining surface thereof as a second light transmitting surface whose emitted light passes through a respective appropriately located aperture provided in the column strip to reflective means which reflects light emitted from this second light transmitting surface back up through the light cell and out the viewing surface.

3,579,020
ELECTRON DISCHARGE DEVICE WITH ELECTRODE SPACER HAVING INTEGRAL ELECTRON VIBRATION DAMPENING MEMBER THEREON
William F. Cullen, Philpot, Ky., and Othmar E. Ringeman, St. Meinrad, Ind., assignors to General Electric Company
Filed Dec. 13, 1968, Ser. No. 783,543
Int. Cl. H01j *1/18, 19/12*
U.S. Cl. 313—269 **4 Claims**



An insulative electrode spacer member is provided for an electron discharge device, which spacer comprises a disc of natural mica provided with a cathode dampening arm as an integral part of the spacer. A hole is formed in the mica spacer adjacent the dampening arm for the insertion of a cathode which is properly engaged by a free end of the dampening arm which is positioned on the top of the cathode. The cathode may be notched at the top and the arm so positioned with respect thereto that the arm only engages the bottom of the notch when the cathode expands due to normal operational heating.

3,579,021
INCANDESCENT LAMP HAVING LINEAR OUTPUT
Stephen F. Kimball, Beverly, Mass., assignor to Sylvania Electric Products, Inc.
Filed Apr. 30, 1969, Ser. No. 820,369
Int. Cl. H01j *1/96, 19/52*
U.S. Cl. 313—274 **5 Claims**

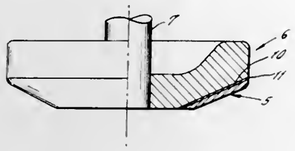


The coiled filament of an elongated tubular incandescent lamp is axially mounted and supported therein by spacers bearing against the inside wall of the lamp envelope. The space between filament turns is less at its ends than at its center in order to yield a substantially uniform output of radiational energy from the entire length of the lamp.

3,579,022
ROTARY ANODE FOR X-RAY TUBE
Walter Hennig; Karl Sedlatschek, and Rudolf Machenschalk, Reutte, Tirol, Austria, assignors to Schwarzkopf Development Corporation, New York, N.Y.
Filed Aug. 16, 1968, Ser. No. 753,210
Claims priority, application Austria, Aug. 28, 1967, A7870/67
Int. Cl. H01j *35/10, 35/26*
U.S. Cl. 313—330 **2 Claims**

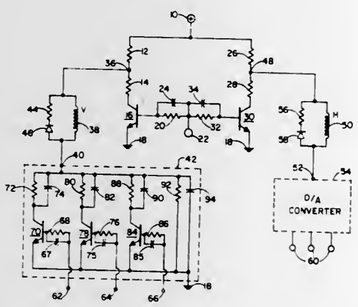
A rotary anode for an X-ray tube, the anode body consisting essentially of graphite, and having a target layer bonded

thereto consisting essentially of a tungsten-rhenium alloy; in an alternate embodiment, to improve the bonding between the target layer and the anode body, a thin stratum consisting essentially of rhenium is interposed between the anode body and the tungsten-rhenium target layer;



and processes of uniting the target layer to the anode body, including depositing the tungsten and rhenium layer on the anode body out of a gas phase, and depositing the intermediate rhenium layer between the target layer and the anode body out of a gas phase.

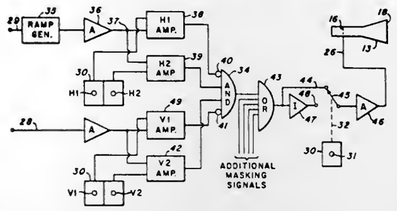
3,579,023
CONTROL APPARATUS
Morton H. Fox, Alhambra, Calif., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Mar. 28, 1969, Ser. No. 811,523
Int. Cl. H01j *27/70*
U.S. Cl. 315—18 **7 Claims**



A high-speed digital deflection switch system incorporating a digital-to-analog conversion circuit comprising a plurality of resistors in a ladder network which are switched into and out of the circuit by digital input signals for providing current changes through a magnetic deflection coil. This circuitry is accompanied by linearizing capacitors to produce a more constant deflection rate and further includes a circuit for changing the character size from large to small letters.

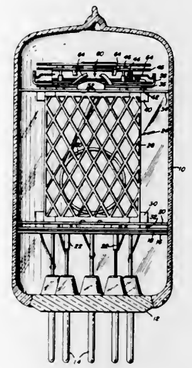
3,579,024
SELECTIVE BLANKING CONTROL CIRCUIT
David A. Sokolov, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Division of Ser. No. 700,317, Jan. 2, 1968, Pat. No. 3,459,888, which is a continuation-in-part of application Ser. No. 532,289, Mar. 7, 1966. Filed Feb. 3, 1969, Ser. No. 823,211
Int. Cl. H01j *29/52*
U.S. Cl. 315—22 **6 Claims**

Apparatus for selectively masking graphic material to be recorded on photographic film wherein masking is performed by using a cathode ray tube (CRT) to generate and position a light pattern over an area of the graphic material to be masked thereby overexposing the film in the area of the light pattern when the graphic material is imaged onto the film and wherein a light pattern is formed by selectively blanking the CRT electron beam in one embodiment by a circuit operating on the CRT horizontal and vertical deflection



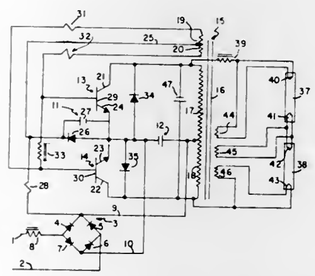
signals and in another embodiment by a circuit operating on the CRT horizontal and vertical synchronization pulses.

3,579,025
NUMERICAL INDICATOR TUBE WITH BUILT-IN TRANSLATING CIRCUIT
Harold J. Rayner, Wellesley, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed Feb. 3, 1969, Ser. No. 795,856
Int. Cl. H01j *17/34;* **H03k** *23/38*
U.S. Cl. 315—84.6 **3 Claims**



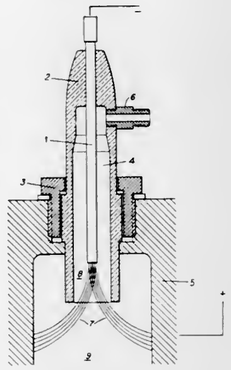
A numerical indicator tube which includes means for translating coded electrical information such as binary data into decimal readout.

3,579,026
LAMP BALLAST
Frederick W. Paget, Hamilton, Mass., assignor to Sylvania Electric Products Inc.
Filed Jan. 2, 1969, Ser. No. 788,524
Int. Cl. H05b *39/00, 41/02, 41/24*
U.S. Cl. 315—99 **5 Claims**



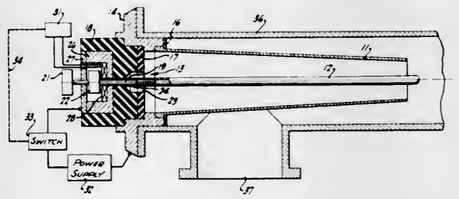
A solid-state ballast for an electric discharge lamp, the ballast including an unfiltered full-wave rectifier, a transistor inverter for increasing the frequency and a transformer for coupling the lamp.

3,579,027
IGNITING AID FOR HIGH EFFICIENCY PLASMA PRODUCERS
Maximilian Pater, Vienna, Austria, assignor to Gebr. Bohler & Co. Aktiengesellschaft, Vienna, Austria
Filed Mar. 4, 1968, Ser. No. 710,175
Claims priority, application Austria, Mar. 3, 1967, A2031/67
Int. Cl. H01j *7/30*
U.S. Cl. 315—111 **7 Claims**



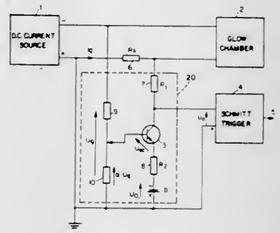
An ignition device for high efficiency plasma producers, which device precludes the necessity for extremely high voltages to produce the initial ignition of the plasma producer by providing high specific ionic densities between the electrodes thereof. The ignition device consists of an annular passage surrounding a rod electrode and through which ionizable gas is passed. The cylindrical wall which defines the outer periphery of the annulus continues axially beyond the end of the rod electrode to form a first tubular passage. A further cylindrical wall forms a second larger diametered tubular passage beyond said first tubular passage. An arc is struck between the rod electrode and the cylindrical wall forming the second tubular passage, which arc has electric lines of force in the form of a cone with the apex pointing upstream the direction of the flow of the ionizable gas. The cone-shaped arc has an azimuthal magnetic field on the inside and outside thereof, and as the gas goes through the arc it is partially ionized and the opposite charge carriers are radially separated by the azimuthal magnetic field. By virtue of the separation, there is less tendency for the opposite charge carriers to recombine, and consequently there is a higher specific ionic density when the gas is introduced between the electrodes of the high efficiency plasma producer.

3,579,028
CONVERGING-BARREL PLASMA ACCELERATOR
T. O. Paine, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Dah Yu Cheng, Menlo Park, Calif.
Filed Oct. 23, 1968, Ser. No. 769,998
Int. Cl. H01j *1/50, 7/24;* **H05b** *1/00*
U.S. Cl. 315—111 **7 Claims**



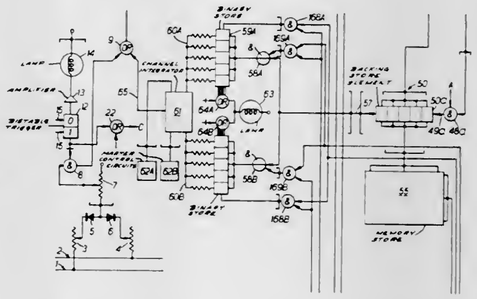
The invention comprises a device for generating and accelerating plasma to extremely high velocity, while focusing the plasma to a decreasing cross section for attaining a very dense high-velocity plasma burst capable of causing nuclear fusion reactions. A converging coaxial accelerator-electrode configuration is employed with "high-pressure" gas injection in controlled amounts to achieve acceleration by deflagration and focusing by the shaped electromagnetic fields.

3,579,029
MONITORING CIRCUIT FOR A HIGH-INTENSITY GLOW DISCHARGE FOR METALLURGICAL PROCESSES
Gelli Spescha, Winterthur Zurick, Switzerland, assignor to Elektrophysikalische Anstalt Bernhard Berghaus, Vaduz, Liechtenstein
Filed Oct. 24, 1967, Ser. No. 677,660
Claims priority, application Germany, Nov. 9, 1966, J32191
Int. Cl. H02h *7/00*
U.S. Cl. 315—127 **2 Claims**



Monitoring circuit for a glow discharge wherein the voltage and current of the discharge are compared by the circuit and a Schmitt trigger generates a control signal if the voltage-current relationship indicates unsafe operation.

3,579,030
STAGE LIGHTING CONTROL UNIT
Frederick Percy Bentham, Ealing, London; Phillip Robert Sheridan, Bickley, Kent; Joseph Trevor Foreman, Wembley Park, and Ian William Stimpson, Windsor, England, assignors to The Strand Electric & Engineering Company Limited, London, England
Filed May 2, 1968, Ser. No. 726,001
Claims priority, application Great Britain, May 3, 1967, 20,462/67
Int. Cl. H05b *37/00*
U.S. Cl. 315—291 **12 Claims**



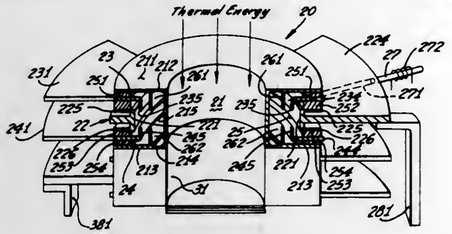
A stage lighting control unit in which dimmer line signals are recorded in a memory unit for subsequent recall, and in which an active memory connected between the dimmer lines and the memory store includes a backing store for reading information into and out of the memory unit and also includes a pair of individual active memory elements into which information can be written from the backing store for transmission to the dimmer lines.

3,579,031
ZERO ARC DROP THYRATRON

William J. Kearns, Arcadia, Calif., assignor to Xerox Corporation

Filed June 7, 1967, Ser. No. 644,146
Int. Cl. H01j *17/08, 17/20*

U.S. Cl. 315—363 **18 Claims**



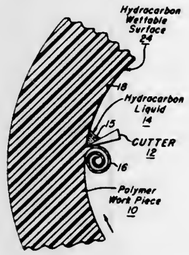
A thyratron has a tubular cathode, preferably made of rhenium and circumscribed by a grid which in turn is circumscribed by an anode tube. The thyratron cavity is filled, e.g., with vapor pressure regulated cesium. The operating parameters can be chosen to establish essentially zero voltage drop across the thyratron. The cathode cavity is contiguous with a cavity of a thermionic converter.

3,579,032
PROCESS FOR IMPROVING THE OLEOPHILIC PROPERTY OF POLYMERS

Robert B. Jacobs, Homewood, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Aug. 13, 1968, Ser. No. 752,277
Int. Cl. H05f *3/06*

U.S. Cl. 317—2 **4 Claims**



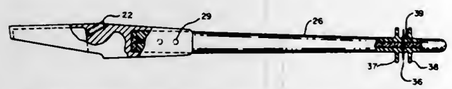
This invention concerns a process for improving the oleophilic property of polymers, particularly polyethylene, and comprises shaving off the external layer of a polymer in the presence of a hydrocarbon cutting material. Shaving the polymer in this manner presents a new surface which is readily wet by hydrocarbons.

3,579,033
ELECTROSTATIC DISCHARGER WITH INTERNAL RESISTANCE ELEMENT

Larry B. Phillips, Santa Clara, Calif., assignor to Granger Associates, Palo Alto, Calif.

Filed Apr. 22, 1969, Ser. No. 818,265
Int. Cl. H05f *1/00, 3/00*

U.S. Cl. 317—2 **6 Claims**



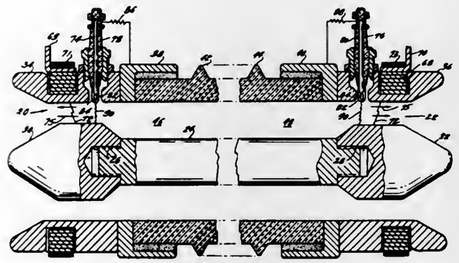
A discharger for reducing electrostatic discharge interference on objects such as aircraft having an elongated insulating body with an internal resistive element connecting the object to a conductive discharge element at the end of the body via the resistive element.

3,579,034
COMPRESSED GAS SYSTEM FOR ARC EXTINCTION

Otto Jensen, Malvern, Pa., assignor to I-T-E Imperial Corporation

Division of Ser. No. 568,942, July 29, 1966, Pat. No. 3,452,-251. Filed Feb. 7, 1969, Ser. No. 817,208
Int. Cl. H02h *3/00, 9/06, 7/24*

U.S. Cl. 317—11 **14 Claims**



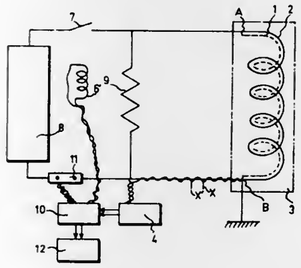
A capacitor bank protection system having series-connected spark gaps fired responsive to the firing of a precision spark gap connected in parallel with one of the series gaps. Each pair of spark gaps is disposed at the outer end of a central elongated electrode surrounded by cooperating ring-shaped electrodes at the outer ends of the central electrode. An air blast is introduced into the annular space between the central electrode and outer cooperating electrodes for extinguishing the arc.

3,579,035
SYSTEM FOR DETECTION OF TRANSITION BETWEEN SUPERCONDUCTIVE AND RESISTANT STATE IN SUPERCONDUCTIVE COILS

Pierre Burnier, Thairy, and Jack Moreau, Orsay, France, assignors to Societe Generale de Constructions Electriques et Mecaniques (Alsthom), Paris, France

Filed Sept. 27, 1968, Ser. No. 763,251
Int. Cl. H01h *3/28*

U.S. Cl. 317—13 **5 Claims**



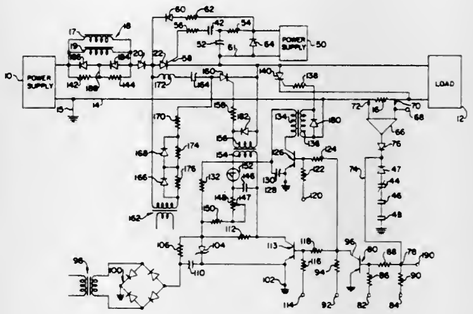
An auxiliary winding is located adjacent the main winding of the superconductive coil, the flux relationship between the flux generated by the main winding and by the auxiliary winding being a predetermined factor, for example unity or a whole number factor of proportionality; upon transition from superconductive to resistant state of any portion of the main winding, the IR drop in the superconductive winding will appear as a signal between the superconductive winding and the auxiliary winding, irrespective of inductive voltages. This signal is compared with a voltage drop across a resistance in the supply of the main winding to obtain an alarm which can be used to disconnect the superconductive coil from a supply.

3,579,036
CROWBAR CIRCUIT FOR VOLTAGE CUTOFF WITH SERIES AND SHUNT SWITCHABLE MEANS

Marion B. McCoy, Centerville, Ohio, assignor to The National Cash Register Company, Dayton, Ohio

Filed Jan. 24, 1969, Ser. No. 793,677
Int. Cl. H02h *3/00, 7/00, 5/00*

U.S. Cl. 317—16 **14 Claims**



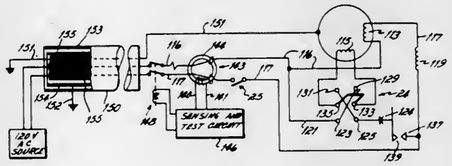
A crowbar circuit comprises means sensitive to an overcurrent condition through a load to promptly throw a crowbar across the load, thereby isolating the load from its power supply. To prevent an unreasonable dissipation of power through the crowbar, the same sensing mechanism which throws the crowbar initiates operation of a time delayed mechanism which disconnects the power supply from the crowbar. To further conserve the power supply during the interval following operation of the crowbar and before disconnection of the power supply, the circuit includes energy absorbing means which retards dissipation of power from the power supply.

3,579,037
PORTABLE TOOL

Donald J. Hackman; Ronald L. Legue, Columbus; Jeremy M. Harris, and Donald E. Roop, Worthington, Ohio, assignors to Oceanautic Manufacturing and Research Company, Cincinnati, Ohio

Continuation-in-part of application Ser. No. 754,783, Aug. 23, 1968. This application Nov. 12, 1968, Ser. No. 774,622
Int. Cl. H02h *3/28, 7/26*

U.S. Cl. 317—18 **29 Claims**



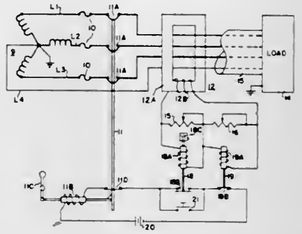
An electric motor-driven portable tool for use underwater. The tool and motor are insensitive to water depth and corrosion because of the tool design and choice of materials. To minimize the danger of electrical shock to the human operator, the tool is used in combination with a safety trip circuit which is effective to cut off all power to the tool in less than 30 milliseconds in the event of a short circuit or even a minimal current leak in either the tool or cable supplying current to the tool. Additionally, the tool motor is insulated from the housing, the tool housing is grounded by a third ground or neutral wire in the power cable and the cable has a metal sheath which is also grounded at or near the power source.

3,579,038
ELECTRICAL FAULT PROTECTION SYSTEM

Robert P. Backderf, Franklin, and Douglas R. Kanitz, Middletown, Ohio, assignors to Square D Company, Park Ridge, Ill.

Filed Aug. 14, 1969, Ser. No. 850,212
Int. Cl. H02h *3/28, 7/26*

U.S. Cl. 317—18 **7 Claims**



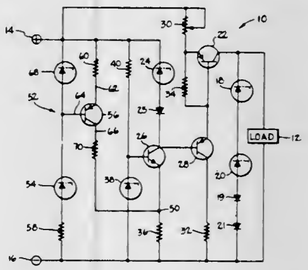
A normally open relay and a normally closed relay responsive to fault currents in an electrical distribution system control the opening of a disconnect switch incapable of interrupting large fault currents. The contacts of the relays are connected in series in an energizing circuit for an electroresponsive operator of the disconnect switch. Upon occurrence of a small fault, such as a ground fault, the contact of the normally open relay closes after a short time delay to effect opening of the disconnect switch. Upon occurrence of a large fault, the contact of the normally open relay also closes as for a small fault, but the contact of the normally closed relay opens instantaneously to prevent opening of the disconnect switch.

3,579,039
SURGE PROTECTION CIRCUIT

Ivan R. Damon, Tinley Park, Ill., assignor to SCM Corporation, New York, N.Y.

Filed Feb. 17, 1969, Ser. No. 799,678
Int. Cl. H02h *3/22*

U.S. Cl. 317—22 **16 Claims**



A regulated power supply is protected from input potential surges by a transistor and Zener diode input network which shuts down the regulated supply whenever the input potential exceeds a predetermined maximum level. When an input potential surge occurs, current flows through a Zener diode and transistor series circuit connected across the input terminals, and a shutdown current flows from the transistor into a shutdown node within the power supply.

3,579,040
DESENSITIZING CIRCUIT FOR A DIFFERENTIAL RELAY

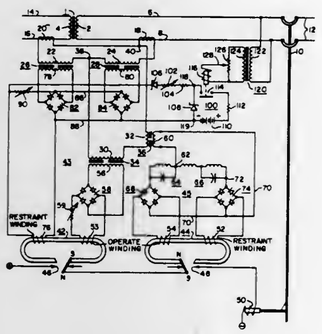
Nathaniel D. Tenenbaum, Plainfield, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 18, 1969, Ser. No. 800,109
Int. Cl. H02h *3/28*

U.S. Cl. 317—27 **17 Claims**

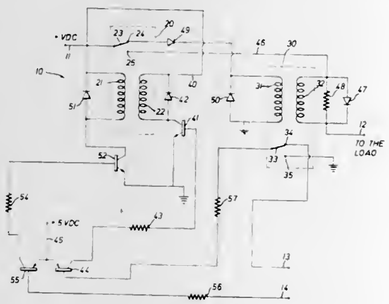
A differential type protective relaying apparatus for a power-transforming device; the relaying apparatus having

first and second switches controlled by first and second operate elements and first and second restraint elements; said first operate element being energized as a function of the difference between the input and output energy of the transferring device and said first restraint element being energized as a function of the amount of energy passed through the transferring device and there is provided a second circuit, energized as a consequence of an overvoltage applied to the transferring device to supply additional energization to the first restraint element; the second operate element being



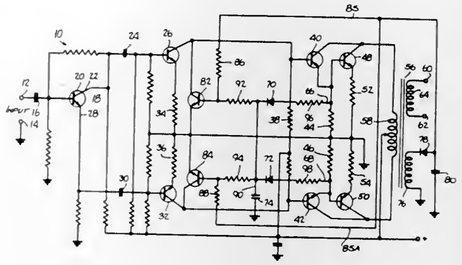
energized as a function of the magnitude of the fundamental frequency portion of the difference between the input and output energy to and from the transferring device; and the second restraint element being energized as a function of the magnitude of the second harmonic frequency portion of the difference between the input and output energy to and from the transferring device. The relaying apparatus being effective to disconnect the power-transferring device when one or the other of the first or the second operate element overcomes its associated restraint element.

3,579,041
CIRCUIT BREAKER UTILIZING MAGNETIC LATCHING RELAYS
T. O. Paine, Acting Administrator of the National Aeronautics and Space Administration with respect to an invention of; Williard E. Reynolds, and Henry W. Reinhold, Plymouth, Mich.
Filed Oct. 30, 1968, Ser. No. 771,759
Int. Cl. H02h *3/08*
U.S. Cl. 317—33 **3 Claims**



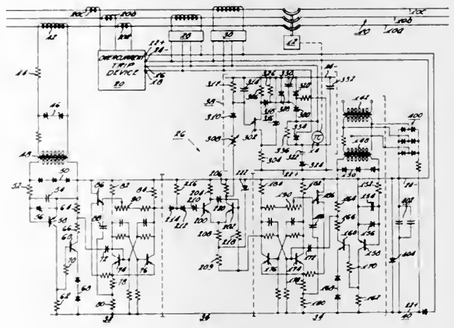
In circuit breakers wherein power consumption is significant, a circuit breaker relay being operably controlled by switching transistors normally biased off, the operation of which is triggered by a magnetic latching relay having a coil sensitive to current flow and requiring current flow only on switching.

3,579,042
PROTECTION CIRCUIT WITH SIMULTANEOUS VOLTAGE AND CURRENT SENSING MEANS
Irving J. Abend, Bergenfield, N.J., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Dec. 23, 1968, Ser. No. 786,027
Int. Cl. H02h *7/00*
U.S. Cl. 317—33 **17 Claims**



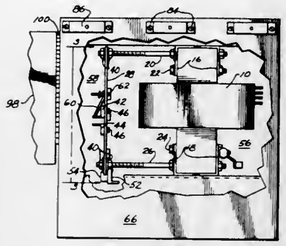
Dynamic short circuit and overload protection circuit for transistorized power amplifiers; the circuit is noninstantaneous in operation and comprises means for sensing current through and voltage across a transistor to be protected, means for combining, and integrating with respect to time, signals related to the sensed voltage and current to provide a control signal, and means for shunting the input to the transistor when the control signal reaches a predetermined value.

3,579,043
REVERSE POWER RELAY
Charles P. Goeller, Quincy, Mass., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Nov. 15, 1968, Ser. No. 776,127
Int. Cl. H02h *3/38*
U.S. Cl. 317—36 **2 Claims**



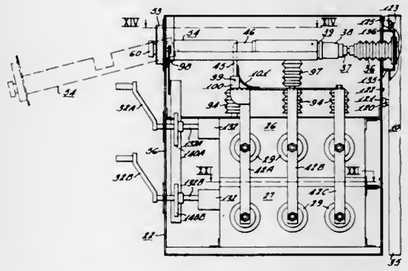
A reverse power relay using semiconductor components is provided to sense the phase relationship between current and voltage in an electric circuit and to trip a circuit breaker controlling that circuit in the event of reverse power conditions. The reverse power relay comprises an amplifier and current multivibrator circuit, an amplifier and potential multivibrator circuit, a comparator circuit, and a timing and output circuit. Current and voltage condition signals from the two multivibrator circuit are compared in the comparator circuit and, if a reverse power condition exists, an output signal from the timing and output circuit operates a trip coil which trips the circuit breaker. The reverse power relay is powered from the same power supply as a known type of overcurrent trip device.

3,579,044
UNIT SUBSTATION WITH TRANSFORMER AND CONTROL COMPARTMENTS
Lawrence Phillips, Jr., 840 Inverness, Pasadena, Calif. 91103
Filed Nov. 13, 1969, Ser. No. 876,465
Int. Cl. H01f *27/06, 27/04*
U.S. Cl. 317—103 **10 Claims**



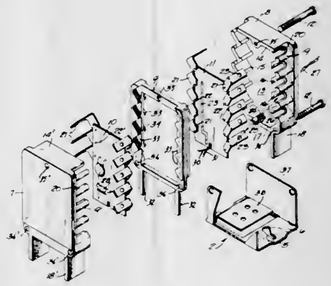
A frame of the unit substation employs the upper and lower core clamping members of a transformer and a pair of spaced-apart transformer supporting members which support the transformer by carrying the lower clamping members. A barrier of insulating material is mounted within a housing through the bolts used to exert the clamping force of the core clamping members on the core of the transformer. Output terminals from the secondary side of the transformer are connected directly to corresponding horizontally disposed bus bars. The barrier mounts the bus bars and separates the interior of the housing into a transformer compartment and a controller compartment. The substation is constructed such that air can freely circulate through not only the transformer compartment but also the control compartment.

3,579,045
HIGH VOLTAGE AIR TERMINAL CHAMBER FOR INDOOR POWER CENTER WITH INTERLOCKS BETWEEN FUSE DRAWERS AND CIRCUIT BREAKERS, FUSE CLAMPING AND LATCHING MEANS, AND UNIVERSALLY PIVOTAL TERMINAL MEANS
Thomas H. Keogh, Pittsburgh, and Adolph E. Krupit, Allison Park, Pa., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed Oct. 18, 1968, Ser. No. 768,811
Int. Cl. H01h *9/20;* **H02b** *1/18*
U.S. Cl. 317—114 **55 Claims**



An indoor unit substation for supplying electrical power at distribution voltage includes an electrical transformer and an air terminal chamber enclosing terminating means for tap cables from a plurality of high-voltage primary feeder sources, a circuit interrupter for each source, and high-voltage fuses between the circuit interrupters and the transformer supported on horizontal drawout drawers in alignment with horizontal insulating bushings on the transformer. Manual fuse clamping means push the fuses into high-pressure contact with universal motion terminals on the transformer-insulating bushings, latching means are provided for the fuse drawers, and the fuse-clamping means prevent release of the drawer-latching means until clamping pressure is removed from the fuses. Interlock means prevents withdrawal of the fuse drawers if a circuit interrupter is closed, prevents closing of either circuit interrupter if a fuse drawer can be withdrawn, and prevents simultaneous closing of both circuit interrupters.

3,579,046
ELECTRICAL HOUSING ASSEMBLY HAVING A PLURALITY OF CHAMBERS WITH ADJACENT CIRCUIT BOARD ELEMENTS
Charles Edward Jordan, Milwaukee, Wis., assignor to Jordan Controls, Inc., Milwaukee, Wis.
Filed May 2, 1969, Ser. No. 821,263
Int. Cl. H05k *5/02, 1/14*
U.S. Cl. 317—120 **10 Claims**



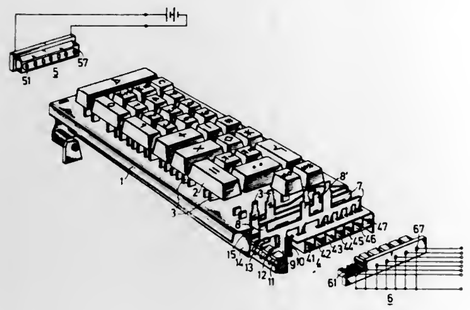
This disclosure includes a housing assembly which can directly replace the usual electromagnetic contactor. The assembly includes opposed similar end housing sections including inwardly projecting and aligned sidewalls. A shallow intermediate wall is interposed between the opposite end sections. Contact boards are provided with a plurality of contact lugs which project outwardly and upwardly along the opposite side edges. The boards are disposed between the end sections and intermediate wall with the contact lugs mating with recesses in the intermediate wall and firmly clamped in place by the ends of the sidewalls of the end sections.

Components are mounted to the circuit boards facing the end sections with printed connections to the opposite side.

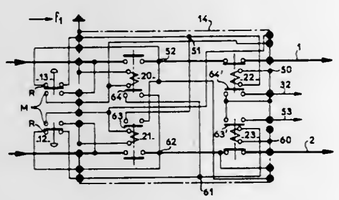
3,579,047
KEYBOARD USING SWITCHES HAVING LIGHT OBSTRUCTING ELEMENTS
Konrad Sturm, Nurnberg; Willy Becker, Behringersdorf; Heinz Timm, Brunn, and Karlheinz Rummel, Nurnberg, Germany, assignors to Firma Diehl, Nurnberg, Germany
Filed Feb. 13, 1969, Ser. No. 798,881
Claims priority, application Germany, Feb. 13, 1968, P 15 74 554.7
Int. Cl. G06m *7/00*
U.S. Cl. 250—221 **12 Claims**

Keyboard apparatus for producing switch signal combinations in a code used in office machines includes a number of individual light beam producing means corresponding in number to the number of channels used in the code, and a number of individual keys, each of which carries one or more light-obstructing barriers, the number and position of the barriers on a particular key corresponding to the number and position of the channels used in the machine code system to

indicate the signal combination associated with the key so that when a key is depressed the light beams will be selectively interrupted to thereby form a coded signal representing the depressed key.



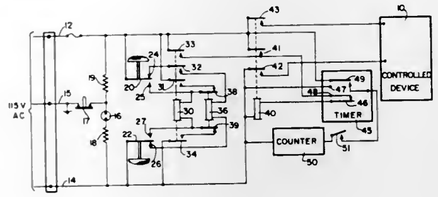
3,579,048
ELECTRIC SAFETY-BOX
Rene Auffret, Savigny-sur-Orge, France, assignor to Nord-Aviation Societe Nationale De Constructions Aeronautiques, Paris, France
Filed Apr. 1, 1969, Ser. No. 811,732
Claims priority, application France, Apr. 4, 1968, 147,069
Int. Cl. H01h *47/16*
U.S. Cl. 317—135 **8 Claims**



Safety-box connected to pushbuttons comprising a first line and a second line, a control relay and a safety relay on each line, each relay jointly controlling a main contact and an auxiliary contact, the main contact of the control relay being normally open and the main contact of the safety relay being normally closed in the position of rest of the pushbuttons, the auxiliary contact of the control relay of the first line being connected in parallel with the rest contact of the pushbutton of a second line between a point located downstream of the main relay of the second line and the control winding of the safety relay of the said second line.

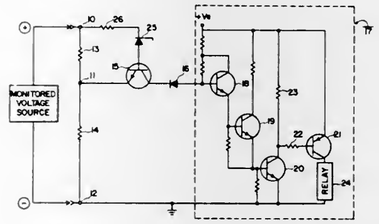
3,579,049
SAFETY CONTROL SYSTEM FOR ACTUATING ELECTRICALLY CONTROLLED MECHANICAL DEVICE
Donald D. Kikta, Downers Grove, Ill., assignor to Grayhill, Inc., La Grange, Ill.
Filed Nov. 28, 1969, Ser. No. 880,657
Int. Cl. H01h *47/22*
U.S. Cl. 317—135 **8 Claims**

A control system for an electrically controlled device for applying energy thereto including first and second hand-operated switches positioned to be actuated by the two hands of an operator, and a relay actuated by simultaneous operation of the switches including a contact for controlling the output circuit which energizes the device. A second relay having normally closed contacts connected in series with contacts of the first relay provides a holding circuit for the first relay which is released only when both hand switches are released. The output circuit may include a third relay for applying power to the controlled device, and which actuates a



timer which holds the third relay operated for a predetermined time interval.

3,579,050
HIGH-LOW VOLTAGE DETECTOR
Rabindra N. Basu, and Alfred Dvorak, Ottawa, Ontario, Canada, assignors to Northern Electric Company Limited, Montreal, Quebec, Canada
Filed June 11, 1969, Ser. No. 832,139
Int. Cl. H01h *47/32*
U.S. Cl. 317—148.5 **3 Claims**

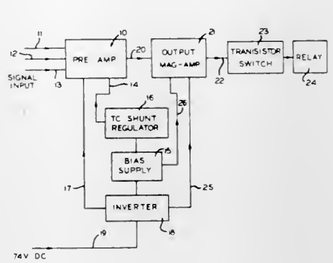


A solid-state circuit for monitoring low and high voltage conditions in either direct current or alternating current voltage sources. A single transistor in a current control circuit is biased into or out of current conduction by two sample voltages which are related to the monitored voltage. The current flow is detected. For all values of the first sample voltage which exceed a predetermined minimum value the current control circuit will conduct current, provided also that the second sample voltage does not exceed a predetermined maximum value. Irrespective of the value of the first sample voltage, the current control circuit will cease current conduction when the second sample voltage exceeds the predetermined maximum value. The minimum and maximum sample voltage values define boundary conditions which correspond respectively to the low and high values of the monitored voltage.

3,579,051
SENSITIVE MAGNETIC AMPLIFIER RELAY DRIVER
Robert M. Olsen, Barrington, Ill., assignor to Vapor Corporation, Chicago, Ill.
Filed Oct. 22, 1969, Ser. No. 868,504
Int. Cl. H01h *47/34*
U.S. Cl. 317—148 **10 Claims**

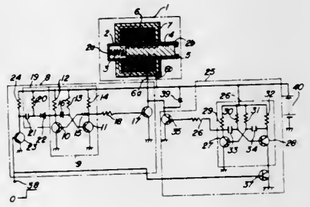
Electronic circuit capable of responding to a low signal input including a preamp magnetic amplifier circuit receiving one or a plurality of input signals and conditioned to deliver an output signal upon overcoming a reference signal, a

second magnetic amplifier circuit for receiving the output signal of the preamp and conditioned to operate as a switch



or as a bistable circuit and thereafter trigger a transistor for operating a relay.

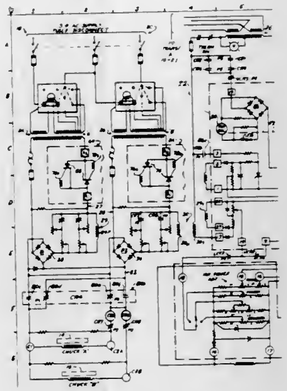
3,579,052
SYSTEM FOR DRIVING A. D. C. ELECTROMAGNET
Takaaki Kato, Toyohashi-shi, and Mamoru Kawakubo, Kariya-shi, Japan, assignors to Nippon Denso Kabushiki Kaisha, Kariya-shi, Japan
Filed Aug. 5, 1969, Ser. No. 847,558
Claims priority, application Japan, Sept. 21, 1968, 43/68579
Int. Cl. H02m *7/44, 7/68*
U.S. Cl. 317—148.5 **7 Claims**



A system for driving a DC electromagnet of the kind in which an armature is attracted by the magnetic action of current supplied to an electromagnetic winding, having an attraction starting circuit for generating a DC voltage for a predetermined period of time for completing the attraction of the armature, and an attraction-holding circuit for generating an intermittent voltage. After the voltage generated by the attraction starting circuit is applied to the electromagnetic winding to complete the voltage attraction of the armature, the intermittent voltage generated by the attraction holding circuit is solely applied to the electromagnetic winding for holding the armature in its attracted state. Thus, a large force of attraction is produced by a DC electromagnet having a small physical constitution and heat generated therein can be reduced.

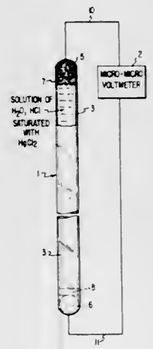
3,579,053
MAGNETIZING AND DEMAGNETIZING APPARATUS AND METHOD
Arthur K. Littwin, 6555 N. Le Mai, Lincolnwood, Ill.
Filed June 26, 1968, Ser. No. 740,052
Int. Cl. H01f *13/00*
U.S. Cl. 317—157.5 **14 Claims**

Apparatus for magnetizing and demagnetizing, including means for adjustable controlling the current and voltage applied to the object to be magnetized, for thereby controlling



the speed of magnetic saturation to more accurately sense the level of saturation in the demagnetizing steps.

3,579,054
GRAVIMETER UTILIZING MASS OF IONS
David S. Moulton, 145 E. Center St. Apt. 32, Provo, Utah
Filed June 20, 1969, Ser. No. 835,195
Int. Cl. H01g *9/00;* **G01m** *3/40*
U.S. Cl. 317—231 **10 Claims**



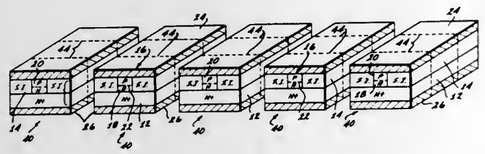
A gravimeter comprising a voltage generator cell and a voltmeter-type instrument responsive to variations of the generated voltages. The cell comprises a tubelike container in which a metal and a solution of its chloride salt cooperate to form the metal ions. The ions form different concentrations at the top and bottom of the tube, and are held in such distribution pattern against the gravitational field force by the electrostatic charge opposing such force. Altitudinal movement of the cell relative to the earth's center changes the gravitational field force with a resulting movement of ions and electrons whereby a variation in the voltage generated by the cell takes place. The change in voltage is generated by the voltage responsive instrument, which may be calibrated to indicate the gravitational field force.

To increase and strengthen the degree of voltage change, a number of cells may be connected serially whereby the voltage variation registered by the voltmeter is the sum of the voltages generated by all the interconnected cells.

ERRATUM

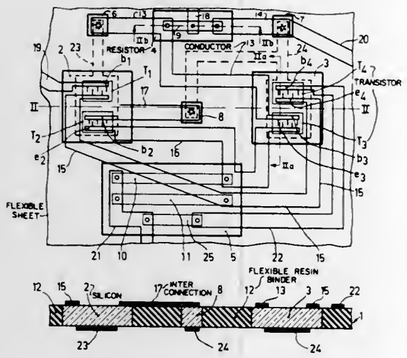
For Class 317—234 see:
Patent No. 3,579,278

3,579,055
SEMICONDUCTOR LASER DEVICE AND METHOD FOR IT'S FABRICATION
Bernd Ross, Arcadia, Calif., assignor to Bell & Howell Company
Filed Aug. 5, 1968, Ser. No. 750,280
Int. Cl. H01l *15/00*
U.S. Cl. 317—234 **10 Claims**



An integral semiconductor diode laser designed for increased heat-dissipation efficiency. A diode element is sandwiched between, and is integral with, layers of semiinsulating semiconductor material. Opposed cleaved surfaces are provided on the device cutting across the diode PN junction and defining a laser cavity through which the PN junction extends. In preparation, a layer of high conductivity semiconductor material is disposed integral with a layer of semiinsulating semiconductor material and the semiinsulating material is grooved to expose portions of the surface of the high conductivity material. Semiconductor material of one conductivity type is then deposited on the exposed high conductivity material, followed by the provision of semiconductor material of opposite conductivity type to form PN junctions within the grooves. The top surface is then lapped to provide coplanarity between the semiinsulating and diode element materials. Electrical contacts are then disposed on the top, coplanar surface and bottom, high conductivity surface.

3,579,056
SEMICONDUCTOR CIRCUIT HAVING ACTIVE DEVICES EMBEDDED IN FLEXIBLE SHEET
Ties Siebolt TeVelde, and Albert Schmitz, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 10, 1968, Ser. No. 767,062
Claims priority, application Netherlands, Oct. 21, 1967, 6714336
Int. Cl. H01l *15/00*
U.S. Cl. 317—234 **8 Claims**

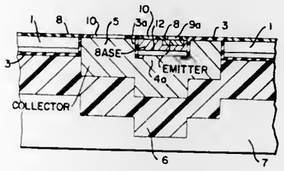


A semiconductor device is described comprising a flexible sheet assembly of separate semiconductor components embedded in an electrically insulating flexible sheet. The contact surfaces of the semiconductor components are exposed. Interconnections may be made between the components by providing metal strips on one or both outer surfaces of the flexible sheet assembly, the connections lying on the outer surface of the intervening sheet material.

3,579,057
METHOD OF MAKING A SEMICONDUCTOR ARTICLE AND THE ARTICLE PRODUCED THEREBY
Arthur Irwin Stoller, North Brunswick, N.J., assignor to RCA Corporation
Filed Aug. 18, 1969, Ser. No. 850,823
Int. Cl. H01l *9/00*
U.S. Cl. 317—234 **11 Claims**

A portion of the surface of a body of single crystalline silicon is etched to provide a wall which is substantially perpendicular to the surface of the body. The body is formed with the surface oriented in a (110) crystallographic plane. The surface is then etched with a crystallographically selective etching solution, such as a hot caustic solution, along a (111) crystallographic plane which extends perpendicularly to the (110) oriented surface.

3,579,058
SEMICONDUCTOR MODULE AND METHOD OF ITS PRODUCTION
Dietrich Armgarth, Dresden, Germany, assignor to Arbeitsstelle Fur Molekularelektronik, Dresden, Germany
Filed Feb. 2, 1968, Ser. No. 702,754
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 **7 Claims**

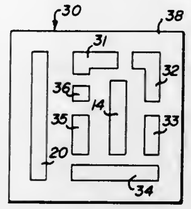


A multilayer junction semiconductor device includes one semiconductive layer of a type of conductivity provided on its upper surface with a recess of a rectangular cross section. Vertical walls and corners of this recess are coated with a thin insulating layer, while the bottom thereof is open. Another semiconductive layer of an opposite type of conductivity is disposed within this recess, so that the critical PN junction area extends perpendicularly to the insulated vertical walls.

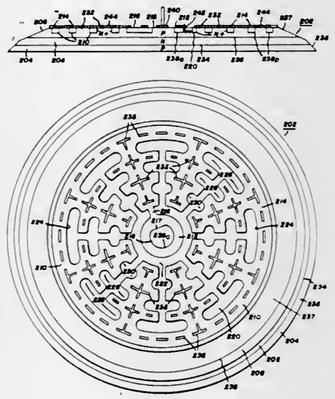
The method of producing this device is based on the semiconductive layer inside said recess serving as an initial temporary substratum on which subsequent layers are precipitated.

3,579,059
MULTIPLE COLLECTOR LATERAL TRANSISTOR DEVICE
Robert J. Widlar, Mountain View, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.
Filed Mar. 11, 1968, Ser. No. 712,040
Int. Cl. H01l *11/00*
U.S. Cl. 317—235 **5 Claims**

A lateral transistor device constructed to have a single emitter region and a single base region operatively associated with a plurality of collector regions. Each of the various collector regions forms a separate PN junction with the base region which is dimensioned and disposed with respect to the base-emitter junction to provide a predetermined portion of the total available collector current.

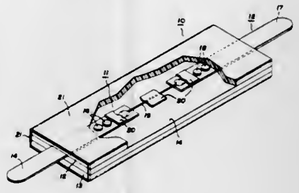


3,579,060
THYRISTOR WITH IMPROVED CURRENT AND VOLTAGE HANDLING CHARACTERISTICS
Robert L. Davis, Union Springs, N.Y., assignor to General Electric Company
Filed Mar. 21, 1969, Ser. No. 809,142
Int. Cl. H01l *11/00, 15/00*
U.S. Cl. 317—235R **11 Claims**



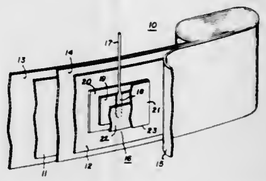
A controlled rectifier is disclosed which is comprised of a main current carrying thyristor which surrounds an integrated gate signal amplifying thyristor. The main thyristor is peripherally beveled to increase the voltage blocking capabilities of the controlled rectifier. The surface of the base layer of the main thyristor is provided with an exposed surface lying at a lower level than the surface of the adjacent emitter layer of the main thyristor, and the exposed base layer surface is interdigitated with the adjacent emitter layer. A metallic contact ohmically connects an emitter layer of the amplifying thyristor to the exposed base layer surface of the main thyristor. The base layer of the main thyristor is also provided with exposed surface portions coplanar with the adjacent emitter layer surface at locations most remote from the fingers of the base layer surface. Additionally, a relatively high resistance current spreading path is provided associated with the emitter layer of the amplifying thyristor, and the amplifying thyristor emitter layer is provided with a minimum spacing from the control lead adjacent the spreading path.

3,579,061
INDIVIDUAL CURRENT-LIMITING FUSE FOR THE ROLLS OF A MULTIPLE ROLL CAPACITOR
Paul L. Waldon, Fort Edward, N.Y., assignor to General Electric Company
Filed Sept. 23, 1968, Ser. No. 761,437
Int. Cl. H01g *1/11*
U.S. Cl. 317—247 **6 Claims**



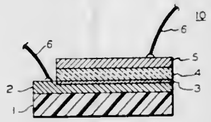
A multiple roll capacitor is disclosed wherein each individual roll section is protected by an isolated current-limiting fuse as a part of the roll tap strap which passes through a central portion of the roll. The current-limiting fuse operates to remove individual defective rolls from the capacitor circuit without significantly adversely affecting the continued operation of the remaining rolls.

3,579,062
ELECTRICAL CAPACITOR WITH THERMAL FUSE
Thomas G. Chapman, Hudson Falls, N.Y., assignor to General Electric Company
Filed Nov. 28, 1969, Ser. No. 880,533
Int. Cl. H01g *1/11*
U.S. Cl. 317—247 **11 Claims**



A thermal fuse for a roll capacitor is disclosed wherein a wire lead is joined to a flag of aluminum which is sandwiched between two pieces of insulating material. A narrow strip of a thermal fusible alloy overlies the flag in the sandwich and extends therefrom. This sandwich is positioned in a capacitor roll between a dielectric strip and a foil strip so that the extending fusible alloy strip lies adjacent the capacitor foil strip for electrical connection thereto.

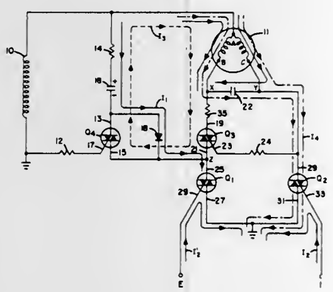
3,579,063
THIN FILM CAPACITOR
Kiyotaka Wasa, and Shigeru Hayakawa, Osaka, Japan, assignors to Matsushita Electric Industrial Co. Ltd., Osaka, Japan
Filed Mar. 24, 1969, Ser. No. 809,801
Claims priority, application Japan, Mar. 25, 1968, Sept. 13, 1968, Sept. 13, 1968, Sept. 13, 1968, 43/19851; 43/66389; 43/66391
Int. Cl. H01g *1/01*
U.S. Cl. 317—258 **1 Claim**



This invention relates to a thin film capacitor. The capacitor comprises a dielectric layer sandwiched between a top

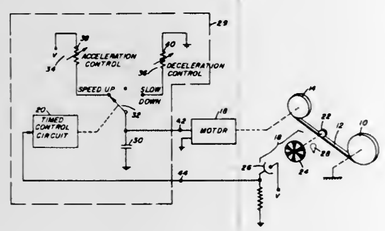
metal electrode and a base titanium electrode which is oxidized at the surface facing said dielectric layer. The dielectric layer consists essentially of a mixture of lead oxide and titanium oxide.

3,579,064
SOLID-STATE MOTOR CONTROL CIRCUIT USING TRIAC ELEMENTS
John R. Taylor, North Wales, Pa., assignor to Sperry Rand Corporation, New York, N.Y.
Filed May 5, 1969, Ser. No. 821,847
Int. Cl. H02p *1/42*
U.S. Cl. 318—207 **9 Claims**



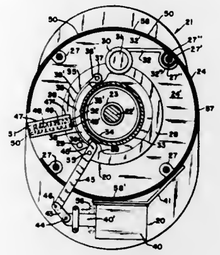
There is disclosed a solid-state control circuit which provides on/off, direction reversal and braking signals for a single-phase motor. The solid-state circuit utilizes a combination of semiconductors which gate AC and DC current through the motor windings in a manner to provide clockwise or counterclockwise shaft rotation as well as on/off and braking signals.

3,579,065
WEB SPEED CONTROL APPARATUS
Joseph F. Laukaitis, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed June 28, 1968, Ser. No. 741,184
Int. Cl. H02p *5/08*
U.S. Cl. 318—314 **4 Claims**



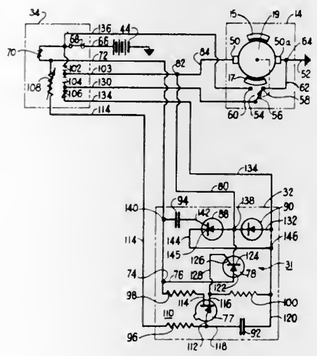
A motor operates to drive a web at a predetermined speed. The speed of the motor is automatically adjusted to assure the proper rate of web speed, such motor being under control of a circuit which not only applies a correction signal to such motor for a "time" dependent on the necessary correction, but also applies such correction through a means the operation of which is itself dependent upon a time constant. This technique permits such broadband control of web speed that accelerating to or decelerating from a reference web speed obtains without hunting. As disclosed the invention uses digital techniques, while incorporating the above-mentioned principles, in such a way that digital-to-analog converter apparatus is obviated.

3,579,066
BRAKE MOTOR ATTACHMENT DEVICE
Clair A. Bearfield, and Raymond Cole, Valley City, N. Dak., assignors to Tri W-G Inc., Valley City, N. Dak.
Filed Apr. 7, 1969, Ser. No. 813,998
Int. Cl. H02k *23/68*
U.S. Cl. 318—372 **2 Claims**



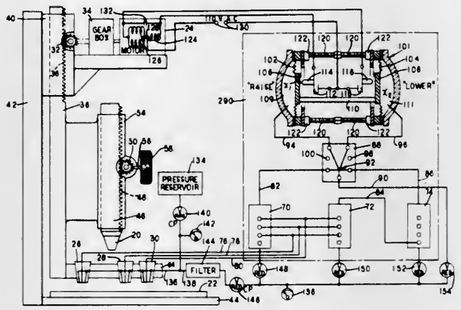
The invention comprises a mechanical brake for an electric motor with a solenoid mechanically connected to a brakeshoe which upon deactuation of the solenoid automatically engages a brakedrum or the rotor of the electric motor to stop the rotation of the motor. The solenoid and electric motor being actuated and deactuated simultaneously and the brakeshoe engagement preventing coasting of the motor after electric current to the motor has been discontinued.

3,579,067
MOTOR CONTROL SYSTEM
William C. Riester, Williamsville, N.Y., assignor to Trico Products Corporation, Buffalo, N.Y.
Filed Sept. 16, 1968, Ser. No. 759,839
Int. Cl. H02p *1/04*
U.S. Cl. 318—444 **8 Claims**



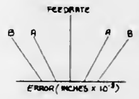
An electric motor-driven windshield wiper system for producing timed dwell periods between cycles of wiper operation incorporating a first silicon-controlled rectifier triggered by a timing network which includes a unijunction transistor which is in turn triggered by an RC circuit. A cyclically actuated switch responsive to motor rotation moves between a running and parking contact. When on the running contact a rectifier is connected in circuit with the motor-energizing circuit and also bypasses the silicon-controlled rectifier thus extinguishing it. A dynamic braking circuit is provided which includes a second silicon-controlled rectifier triggered by charging current of a capacitor in the gate circuit when the cyclically actuated switch moves from the running contact to the parking contact. When the cyclical switch moves to the run position the motor continues to be energized through the rectifier until the cyclic switch reaches the park position thereby triggering the second silicon-controlled rectifier in the dynamic braking circuit.

3,579,068
SERVO CONTROLLED HEIGHT CONTROL
Teh C. Tschang, Springfield, N.J., assignor to Air Reduction Company, Incorporated,, New York, N.Y.
Filed Mar. 11, 1968, Ser. No. 712,217
Int. Cl. G05d *16/00*
U.S. Cl. 318—478 **15 Claims**



A height control unit for maintaining the desired distance between a tool and a substantially flat workpiece on which the tool is working. The control system utilizes fluidic circuitry to measure the reflected pressure of jets of gas directed at the workpiece. The fluidic circuitry develops a signal in response to the reflected pressure which results in the raising or lowering of the tool.

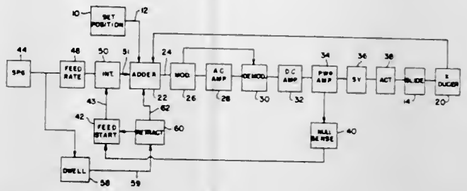
3,579,069
NUMERICAL MACHINE TOOL CONTROL SYSTEM INCLUDING MEANS TO DIGITALLY SIMULATE A TEMPLATE FOLLOWER
Johann F. Reuteler, Elmwood, and James A. Warren, Simsbury, Conn., assignors to Pratt & Whitney Inc.
Filed Sept. 15, 1967, Ser. No. 668,037
Int. Cl. G05b *19/24*
U.S. Cl. 318—571 **14 Claims**



This disclosure relates to a tracer-controlled machine tool adapted for numerical control. The contact gaps actuated by a tracer stylus to control the movement of a cutting tool is electrically simulated and the simulated tracer contact gap is varied with slide velocity. The gap is simulated by a comparison of a velocity signal with a signal proportional to servo position error or lag and the result of this comparison indicates an open or closed contact and actuates a slide drive means in response thereto. This comparison is further utilized to modify the slide velocity to maintain the servo position lag substantially proportional to slide velocity within predetermined limits.

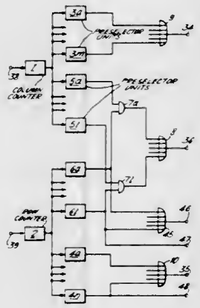
3,579,070
MACHINE TOOL SERVO SYSTEM INCLUDING FEED-RATE CONTROL
Weyman S. Crocker, Springfield, Vt.; Philip H. White, Caremont, N.H., and William T. McDonald, Wayland, Mass., assignors to Pneumo Dynamics Corporation, Cleveland, Ohio
Filed Apr. 15, 1968, Ser. No. 721,479
Int. Cl. G05b *19/24*
U.S. Cl. 318—571 **6 Claims**

An electronic-hydraulic analog position servocontrol system for slide actuation of a machine tool of the automatic type having a sequential mode of operation including position and rate control of portions of the traverse of the slide. A spindle pulse generator and integrator circuit provide a ramp function rate control signal for combination with posi-



tion information for synchronizing slide movement with rotation of the spindle.

3,579,071
ELECTRONIC CIRCUIT ARRANGEMENT FOR PERFORMING WORK STEPS IN THE PRODUCTION OR TESTING OF SEMI-CONDUCTOR MEANS
Kurt Drescher, and Reinhard Springer, Dresden, Germany, assignors to Arbeitsstelle Fur Molekularelektronik, Dresden, Haus, Germany
Filed Dec. 23, 1969, Ser. No. 887,708
Int. Cl. G05b *19/28*
U.S. Cl. 318—603 **24 Claims**

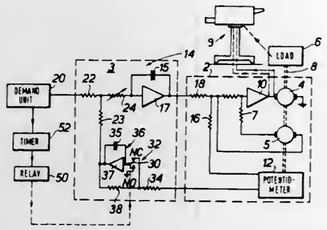


The present invention relates to electronic circuit arrangements for performing predetermined work steps in the production or testing of semiconductor means arranged in rows and columns to form a matrix of said semiconductor means in a coordinate system with individual fields defined at intersections of said rows and columns, wherein row and column measuring and counting means generate coordinate signals which are compared with preselected coordinate digits to produce preselection signals which are channeled through logic circuits to drive means of a positioning apparatus which positions a workpiece support or a tool, for example, in a photorepeater or in a wafer prober, in accordance with the identification of the preselection signals by said logic circuits, whereby any desired extraneous structures may be arranged or tested in said matrix of semiconductor means.

3,579,072
SERVO POSITION CONTROL INCLUDING INTEGRAL CONTROL IN FOREWARD AND FEEDBACK CONTROLS
Dexter Robert Plummer, Leicester; Keith Lawrence Wright, Knighton, and Colin Arthur Wild, Stoneygate, England, assignors to The Rank Organisation Limited, London, England
Filed Oct. 21, 1968, Ser. No. 769,087
Claims priority, application Great Britain, Nov. 3, 1967, 50162/67
Int. Cl. G05b *11/36*
U.S. Cl. 318—609 **8 Claims**

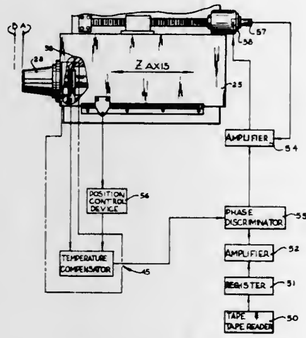
A control system for an actuator, for example, a positional control motor for a camera, includes a demand unit which

provides demand signals representative of different positions or energization levels of the actuator. A control signal is generated by an integrator which is responsive to the demand signal and which compares the change in demand with the state of the actuator immediately before the commencement of the change, as indicated by a memory signal provided by a



further integrator. This control signal, and the actuator energization level, changes at a rate dependent upon, and preferably proportional to, the change in demand. Preferably, therefore, the system is such that a given change in actuator energization takes place in a time interval which is independent of the magnitude of the change in demand.

3,579,073
SPINDLE GROWTH COMPENSATOR
Richard Johnstone, 2400 Rockway Lane E., Brookfield, and Richard E. Stobbe, 4221 S. 104th St., Greenfield, Wis.
Continuation-in-part of application Ser. No. 726,964, May 6, 1968. This application May 20, 1970, Ser. No. 37,485
Int. Cl. G05d *23/275*
U.S. Cl. 318—634 **7 Claims**



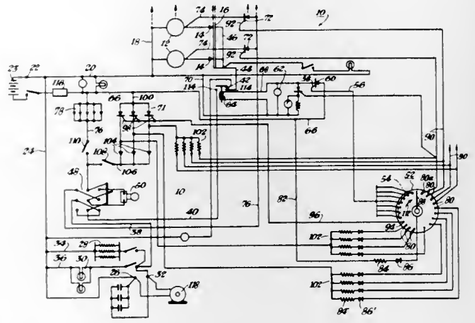
A device for automatically compensating for the expansion and contraction of the spindle of a machine tool due to different operating temperatures. A thermistor, impedance network is utilized to provide a corrective predetermined control signal to the spindle positioning control circuit.

ERRATUM

For Class 318—696 see:
Patent No. 3,579,279

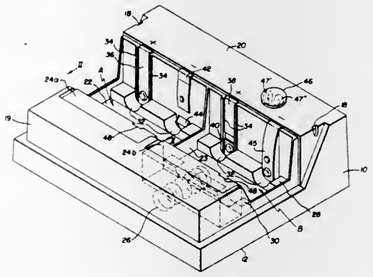
3,579,074
ELECTRONIC POWERED PULSE AMPLIFIER
Clement Michael Richell, Warren, Ohio, assignor to Ray R. Roberts, Warren, Ohio, fractional part interest to each
Filed Nov. 2, 1967, Ser. No. 683,760
Int. Cl. H02m *3/00*
U.S. Cl. 320—1 **22 Claims**

A power pulse amplifier comprises a plurality of capacitors, a charging circuit and a discharging circuit. The charging circuit is arranged to connect the capacitors or groups thereof in parallel to a source of charging potential and includes a switching arrangement for charging individual capacitors or the groups thereof individually and sequentially. The discharge circuit is arranged for discharging all of the capacitors or the groups of capacitors simultaneously after all of the capacitors have been charged sequentially. In



certain embodiments the discharge circuit discharges the capacitors simultaneously in parallel while in other embodiments the discharging circuit discharges the capacitors or the groups thereof simultaneously in series.

3,579,075
COMPACT BATTERY CHARGER FOR RECHARGEABLE BATTERIES OF VARIOUS PHYSICAL SIZES AND ELECTRICAL CAPABILITIES
Linton E. Floyd, Gainesville, Fla., assignor to General Electric Company
Filed Aug. 14, 1968, Ser. No. 752,543
Int. Cl. H02j *7/02*
U.S. Cl. 320—2 **12 Claims**

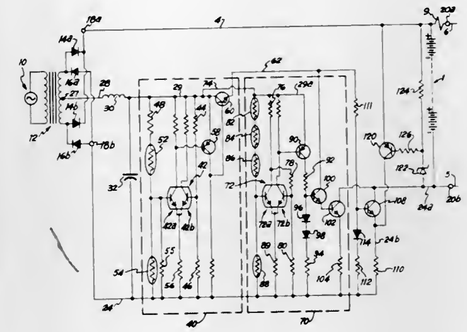


A portable device for simultaneously charging a plurality of batteries of different electrical and physical characteristics. The input power consists of standard household alternating current which is converted within the device to half-wave rectified current. A plurality of current limiting charging circuits is provided and an included housing is formed with battery retaining recesses sized to mechanically discriminate each battery so that it will connect only with the corresponding circuit which has been designed to provide a proper charging current for the corresponding batteries.

3,579,076
CHARGE CONTROL SYSTEM FOR BATTERIES
John A. Herbst, Morristown, and Victor H. Seliger, North Caldwell, N.J., assignors to Singer-General Precision, Inc., Little Falls, N.J.
Filed Dec. 30, 1968, Ser. No. 787,940
Int. Cl. H02j *7/04*
U.S. Cl. 320—36 **16 Claims**

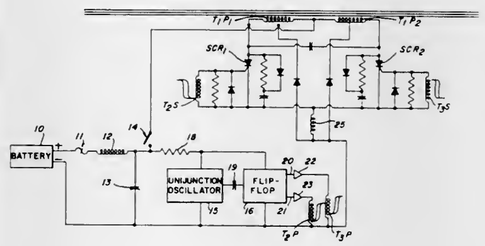
A battery charging system including means for connecting a voltage source to the battery in a manner to establish a high

current path and a low current path through the battery, and a switching means connected in said paths and responsive to



various battery temperatures for providing an open circuit in one or more of the paths.

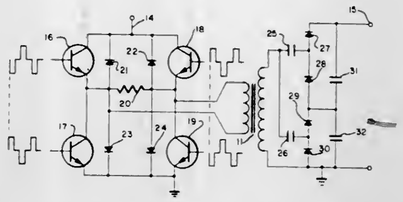
3,579,077
REGULATED STATIC DC TO DC CONVERTER START-UP MEANS
Douglas R. G. Cameron, Montreal, Quebec, Canada, assignor to Pylon Electronic Development Company, Lachine, Quebec, Canada
Filed May 12, 1969, Ser. No. 823,797
Int. Cl. H02m *3/22, 1/18, 7/52*
U.S. Cl. 321—2 **6 Claims**



A static DC to DC converter having an output converter stage comprising a full-wave bridge with an SCR in each of two adjacent legs of the bridge. The firing times of the SCR's are controlled by a variable phase synchronous pulse generator controlled by an operational amplifier having one input connected to a reference voltage source and another input connected to feedback means across the converter's output so that the converter's output voltage is regulated. Means are provided for delaying, during start-up, the application of voltage to the pulse generator to prevent heavy current surges through the SCR's. An overshoot voltage clipper is connected across the output of the operational amplifier.

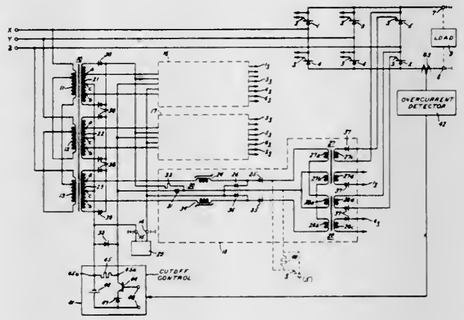
3,579,078
CONSTANT CURRENT HIGH VOLTAGE POWER SUPPLY
Donald L. Cronin, Anaheim; Bertrand F. Fraber, Palos Verdes Peninsula, and Charles R. Nockey, Canoga Park, Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed Oct. 6, 1969, Ser. No. 864,067
Int. Cl. H02m *3/32;* **H02j** *1/04*
U.S. Cl. 321—2 **1 Claim**

A direct current DC source and a square wave voltage source are applied to a bridge type switching amplifier. The output of the amplifier is applied to the primary of a step up transformer, and the secondary of the transformer is con-



nected to a voltage quadrupler. The output of the voltage quadrupler is the desired DC voltage output.

3,579,079
CURRENT SOURCE MAGNETIC GATING CIRCUIT FOR CONTROLLED RECTIFIERS
Fred W. Kelley, Jr., Media, Pa., assignor to General Electric Company
Filed Nov. 17, 1965, Ser. No. 514,430
Int. Cl. H02m *1/08*
U.S. Cl. 321—5 **2 Claims**

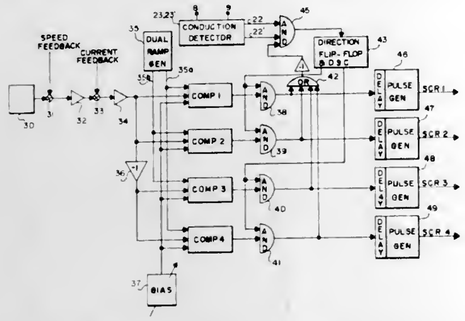


For triggering semiconductor controlled rectifiers, an otherwise conventional gate pulse generator is given the characteristics of a current source by connecting in series therewith a nonlinear impedance comprising a diode poled to block gate current and shunted by the series combination of a source of forward bias voltage and a current limiting resistor.

3,579,080
ZERO DEADBAND REVERSING CONTROL
Donald E. Vollrath, Greenfield, Wis., assignor to The Louis Allis Company
Filed Nov. 13, 1969, Ser. No. 876,470
Int. Cl. H02m *7/68;* **H02p** *1/00*
U.S. Cl. 321—5 **11 Claims**

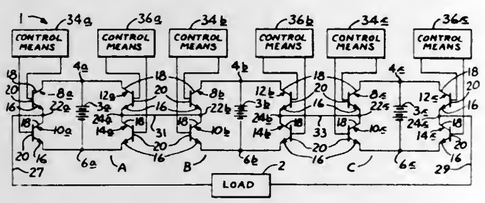
In a reversible phase controlled rectifier control system, zero deadband response is realized by generating overlapping firing waves for forward current and reverse current conducting controlled switch elements of the phase controlled rectifier and controlling the direction of load current flow substantially instantaneously to provide for current to flow alternately in both directions when the system is in a quiescent state. An oscillator driven flip-flop gates firing between forward current and reverse current conducting controlled switch elements to provide immediate current direction control and lockout. The oscillator is responsive to the state of conduction of the controlled switch elements, permitting the firing signals to pass to forward current conducting controlled switch elements when reverse current conducting controlled

switch elements are nonconductive and vice versa. The oscillator drives the flip-flop between its stable states at a high rate when all controlled switch elements are nonconductive



so that the control system is substantially instantaneously responsive to a command for current to flow in either direction.

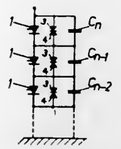
3,579,081
LOW FREQUENCY SINE WAVE GENERATOR CIRCUIT
James W. Bates, Palos Veres Estates, Calif., assignor to Gulton Industries, Inc., Metuchen, N.J.
Filed Nov. 12, 1968, Ser. No. 774,660
Int. Cl. H02m *1/12, 7/00*
U.S. Cl. 321—9 **17 Claims**



A sinusoidal signal generator circuit comprising at least two bridge circuits each comprising two pairs of series-connected bidirectional current control means connected across a source of direct current DC voltage, each bridge circuit having a pair of output terminals at the juncture of the current control means said pairs of current control means at very low frequencies like 60 cycles per second being connected directly in series. The noncorresponding current control means of the pairs of current control means of each bridge circuit are rendered nonconductive sequentially and in different combinations to produce different rectangular pulse output waveforms at the output terminals of said bridge circuit, each waveform respectively comprising positive and negative going pulses of the same amplitude relative to zero, the pulses of the different waveforms each cycle preferably being different in number and phase and of different magnitude, so the waveforms combine in both additive and subtractive relation to produce a resultant stepped sinusoidallike resultant waveform.

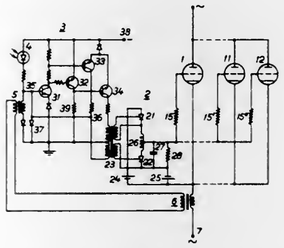
3,579,082
ARRANGEMENT FOR DIVIDING AND LIMITING THE VOLTAGE FOR A CONVERTER HAVING A PLURALITY OF THYRISTOR VALVES CONNECTED IN SERIES
Hans Jurg Bossi, Nussbaumen, and Werner Faust, Wettingen, Switzerland, assignors to Aktiengesellschaft Brown, Boveri & Cie, Baden, Switzerland
Filed Feb. 10, 1969, Ser. No. 797,994
Claims priority, application Switzerland, Feb. 12, 1968, 2,053
Int. Cl. H02m *7/24*
U.S. Cl. 321—11 **6 Claims**

An electrical converter arrangement comprises a chain of converter valves of the controllable semiconductor type such as thyristors connected in series. Condensers are connected in parallel with the semiconductor valves and the capacitance values of the condensers vary progressively downward in the direction towards the lowest potential point on the chain.



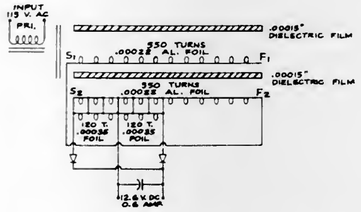
Avalanche diodes arranged oppositely in series are also connected in parallel with the semiconductor valves, and resistances can be connected respectively in series with the condensers.

3,579,083
PROTECTION MEANS FOR RECTIFIERS UPON THE OCCURENCE OF UNDESIRED DISCHARGE CURRENTS
Lennart Bjork, Ludvika, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden
Filed Nov. 3, 1969, Ser. No. 873,539
Claims priority, application Sweden, Nov. 4, 1968, 14921/68
Int. Cl. H02m *1/18;* **H02h** *7/10*
U.S. Cl. 321—13 **6 Claims**



For protecting a rectifier unit including a control pulse amplifier composed of a monostable multivibrator and an OR-gate, the gate being controlled by control pulses to cause the amplifier to transmit a signal to the control electrode to render it conducting, a transformer in the conductor for the rectifier is provided which makes the control pulse amplifier operative to emit a control signal in response to a flow of current in the conductor produced by an external flashover occurring when the rectifier is not conducting.

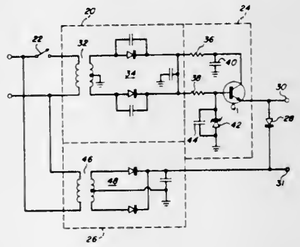
3,579,084
FERRO-RESONANT POWER DEVICE
Elmo E. Moyer, Saratoga Springs, N.Y., assignor to Atto Laboratories, Inc., Rhinebeck, N.Y.
Filed Sept. 10, 1969, Ser. No. 856,570
Int. Cl. H02m *7/06;* **G05f** *3/06;* **H01f** *15/14*
U.S. Cl. 321—16 **4 Claims**



This invention is directed to an integrated ferroresonant stabilizer having a regulated constant voltage output and in

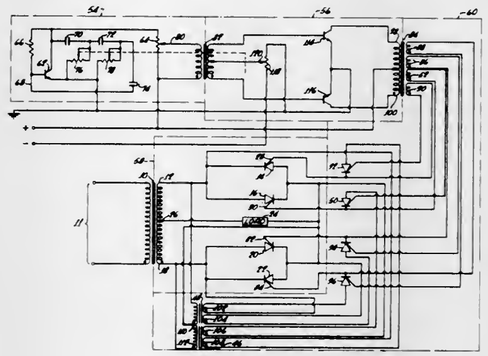
which the secondary windings, of foil interleaved with a dielectric film, provide both inductance and capacitance. A high degree of electrical efficiency is achieved, together with low weight and volume. No external capacitance is required.

3,579,085
POWER SUPPLY FOR PROVIDING MAIN AND STANDBY SOURCES OF POWER
Robert Grodinsky, Skokie, Ill., assignor to Acoustic Research, Inc., Cambridge, Mass.
Filed Sept. 13, 1968, Ser. No. 759,742
Int. Cl. H02m *7/00;* **H03f** *1/00*
U.S. Cl. 321—27 **5 Claims**



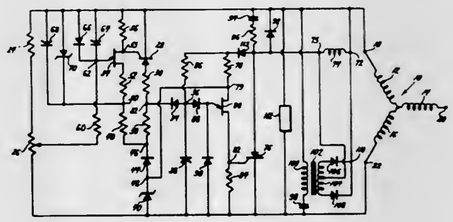
A power supply for high-fidelity amplifier and having a pair of full-wave rectifiers, one with its input permanently connected to line power, the other with a switch for connecting and disconnecting it to line power. The output of the auxiliary rectifier is fed to an input terminal for the amplifier so that portions of the latter can be kept energized at low levels. The other or main rectifier is connected to a regulator to provide a regulated supply and the output of the latter is diode connected to the output of the auxiliary rectifier so that when the main rectifier is turned on it will supply all of the necessary power to all portions of the amplifier.

3,579,086
FREQUENCY CONVERSION CYCLOCONVERTER SYSTEM FOR BOTH SINGLE- AND MULTI-PHASE APPLICATIONS
Paul Lebenbaum, Jr., 2531 Blackthorn, Newport Beach, Calif.
Filed June 19, 1969, Ser. No. 834,644
Int. Cl. H02m *5/30*
U.S. Cl. 321—60 **10 Claims**



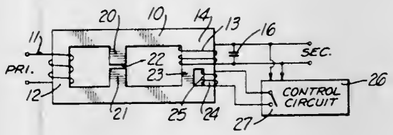
A device for variably decreasing the frequency of a power source by selectively reversing the polarity of the power source voltage applied to a load, wherein the output of the power source and the output of a signal generator, in conjunction, control the polarity of the voltage applied to the load. Such polarity control avoids short circuiting of the power source, reduces circuit complexity, and utilizes power taken directly from the power source output for controlling the polarity switching members. The output voltage of the device may be made proportional to the output frequency, and the device may be utilized in either single- or multi-phase circuits.

3,579,087
GENERATOR SEMICONDUCTOR VOLTAGE REGULATOR
Owen E. Reinert, St. Louis County, Mo., assignor to Sperry Rand Corporation, New York, N.Y.
Division of Ser. No. 568,210, July 27, 1966, Pat. No. 3,470,456.
This application Dec. 31, 1968, Ser. No. 840,544
Int. Cl. H02p *9/30*
U.S. Cl. 322—28 **8 Claims**



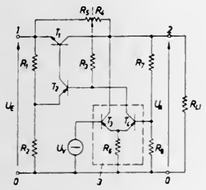
A silicon controlled rectifier, which is connected to the field winding of a generator, has the firing angle thereof controlled by a firing circuit which includes a capacitor; and a second silicon controlled rectifier stores inhibiting energy in that capacitor to vary the firing angle of the first said silicon controlled rectifier.

3,579,088
FERRORESONANT TRANSFORMER WITH CONTROLLABLE FLUX
Taylor C. Fletcher, 1534 Sunnycrest, Fullerton, Lawrence M. Silva, 4110 Maritine, Portuguese Bend, and Bruce L. Wilkinson, 4604 Sharynne Lane, Torrance, Calif.
Filed Apr. 8, 1969, Ser. No. 814,393
Int. Cl. G05f *1/38, 7/00*
U.S. Cl. 323—6 **17 Claims**



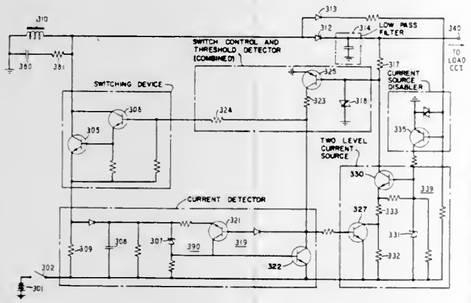
A ferroresonant transformer with means for varying saturation flux capacity for controlling the transformer output. A ferroresonant transformer with at least a portion of the core structure carrying the secondary winding having two separate sections providing parallel magnetic paths for the secondary and resonant flux, with a control winding on one of the sections and a switching circuit for opening and closing the control winding. A low frequency version utilizing E and I laminations with the control winding on one of the outer legs of the E. Another low frequency version utilizing E and I laminations with the control winding encircling a portion of the secondary magnetic circuit. A high frequency version utilizing a plurality of toroid cores with the control winding on one of the cores.

3,579,089
STABILIZED POWER SUPPLY CIRCUITS
Wilfried Elmar Giess, Mannheim, Germany, assignor to Brown, Boveri & Cie Aktiengesellschaft, Mannheim-Kafertal, Germany
Filed Jan. 7, 1969, Ser. No. 789,565
Claims priority, application Germany, Jan. 11, 1968, P 16 13 977.8
Int. Cl. G05f *1/56*
U.S. Cl. 323—22 **6 Claims**



A stabilized power supply circuit is provided having a transistor series control circuit, a resistance voltage divider shunting the load, a control circuit with a control amplifier and a reference voltage source as well as a circuit for superposing disturbances derived from input voltage variations.

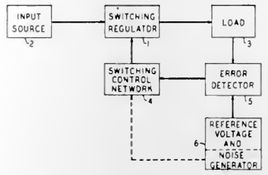
3,579,090
SWITCHING REGULATOR WITH RAPID SWITCHING DRIVE
Eric V. Madsen, New Shrewsbury, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed May 8, 1969, Ser. No. 823,120
Int. Cl. G05f *1/56*
U.S. Cl. 323—22 **6 Claims**



A switching type regulator reduces switching transition times by increasing the magnitude of the switching control signal at the exact interval of the occurrence of the switching transition. The magnitude of the switching control signal is in turn responsive to the output voltage and hence the circuitry to reduce switching transition times also functions to regulate the output voltage.

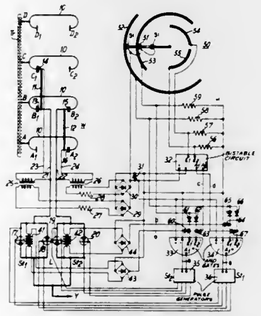
3,579,091
SWITCHING REGULATOR WITH RANDOM NOISE GENERATOR
Patrick W. Clarke, Murray Hill, N.J., and Rudolph Scuderi, New York, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed May 16, 1969, Ser. No. 825,368
Int. Cl. G05f *1/56, 1/64*
U.S. Cl. 323—22 **7 Claims**

A switching regulator-converter wherein the error detector reference voltage is varied with a random noise signal to permit operation of the switching devices at frequencies in the



audible range without the unacceptable acoustical noise normally accompanying these switching frequencies.

3,579,092
TAP-CHANGING REGULATING TRANSFORMER WITH SOLID-STATE CIRCUITRY
Manfred Matzl, Regensburg, Germany, assignor to Maschinenfabrik Reinhausen Gebruder Scheubeck K.G., Regensburg, Germany
Filed Apr. 2, 1970, Ser. No. 24,986
Claims priority, application Germany, Apr. 12, 1969, P 19 18 606.2
Int. Cl. H01f *29/04*
U.S. Cl. 323—43.5S **10 Claims**

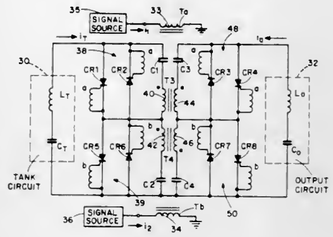


A tap-changing regulating transformer is provided with a tapped winding, a selector switch, a triggerable solid-state circuitry for performing tap-changing operations, trigger pulse generators for triggering said circuitry and automatic control circuitry for controlling said trigger pulse generators. The solid-state circuitry carries the load current permanently, i.e. not only during tap-changing operations, thus dispensing with the provision of current-carrying shunting switches across the solid-state circuitry for carrying load currents during steady state periods when no tap-changing operations are being performed, and further dispensing with operating means for the aforementioned current-carrying shunting switches. The aforementioned trigger pulse generators are controlled to supply the required trigger pulses not only during steady state periods, but also when a noncurrent-carrying movable contact of the selector switch separates from its cooperating fixed contact in order to select another tap of the tapped transformer winding.

3,579,093
VARIABLE MUTUAL COUPLING CIRCUIT EMPLOYING TRANSFORMERS IN AN INDUCTIVE BALANCED CONFIGURATION
Paul R. Johannessen, Lexington, and Thorleif Knutrud, Sudbury, Mass., assignors to Sylvania Electric Products Inc.
Filed Oct. 29, 1969, Ser. No. 872,312
Int. Cl. H03k *17/18*
U.S. Cl. 323—50 **7 Claims**

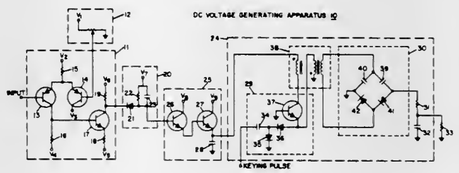
A variable mutual coupling circuit employing a plurality of transformers connected in an inductive balanced configuration between an input circuit and an output circuit. Bipolar

switches associated with the transformers are activated in a predetermined sequence to unbalance the inductance and



thereby transfer energy from the input circuit to the output circuit.

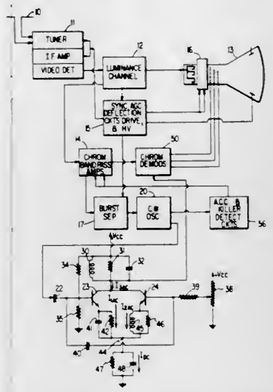
3,579,094
VOLTAGE-GENERATING APPARATUS
Otto A. Jorgensen, Centerport, N.Y., assignor to Hazeltine Corporation
Filed Sept. 26, 1969, Ser. No. 861,378
Int. Cl. H03k *5/00*
U.S. Cl. 323—100 **15 Claims**



Apparatus for generating a DC voltage whose amplitude is controlled in accordance with variations in the amplitude of supplied control pulses. In one embodiment a DC control signal is developed whose amplitude varies in proportion to variations in the amplitude of a supplied DC reference signal and a pulse-type difference signal in which the amplitude of each pulse is representative of the difference between the amplitude of corresponding supplied control pulses and an additional supplied DC reference signal. The control signal is coupled to a DC power supply for controlling the output voltage in accordance with variations in the amplitude of the supplied control pulses.

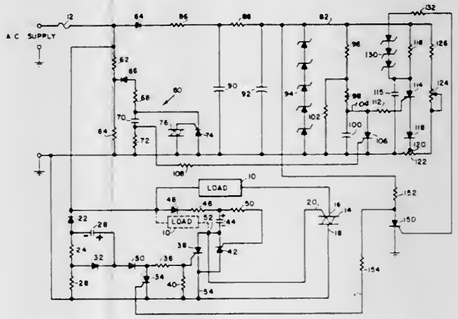
3,579,095
CIRCUITS USING TRANSISTORS TO PROVIDE VARIABLE PHASE SHIFT
Ronald Richard Norley, Indianapolis, Ind., assignor to RCA Corporation
Filed June 3, 1969, Ser. No. 829,970
Int. Cl. H03k *1/12*
U.S. Cl. 323—108 **8 Claims**

A phase shift network for providing a variable shift for a frequency signal while maintaining the amplitude thereof relatively constant. The circuit includes first and second transistors having a common collector network and including first and second reactive networks coupled between the emitter electrodes thereof. A common return path is provided for currents flowing through the transistors and means are coupled to one of the transistor's bases to alter the conduction of the transistors, to provide a variable phase change at the collector electrodes, between a first phase angle deter-



mined by the first reactive network and a second phase angle determined by the second reactive network.

3,579,096
PROPORTIONAL POWER CONTROL CIRCUIT
Edward E. Buchanan, Jr., Dallas, Tex., assignor to Electronic Control Corporation, Euless, Tex.
Filed May 1, 1969, Ser. No. 821,003
Int. Cl. G05f *1/40*
U.S. Cl. 323—22SC **19 Claims**

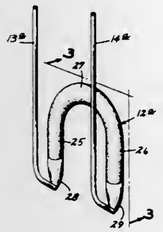


A proportional power control circuit in which the average power applied to the load is controlled by controlling the number of cycles of power applied to a load in a series of available cycles of power. A proportional gate is generated for controlling the application of power to the load. The proportional gate is generated by a circuit which compares a reference voltage that varies in accordance with the demand for power with a ramp voltage whose potential varies as a function of time.

3,579,097
APPARATUS AND METHOD FOR MEASURING THE AMOUNT OF A SELECTED VAPOR IN AN ATMOSPHERE
Alfred J. Luden, Osseo, Minn., assignor to Bureau of Engraving, Inc., Minneapolis, Minn.
Continuation of application Ser. No. 664,808, Aug. 31, 1967, now abandoned. This application Dec. 30, 1969, Ser. No. 888,128
Int. Cl. G01n *27/42*
U.S. Cl. 324—30R **5 Claims**

Apparatus and method for detecting and measuring the concentration of a particular gas in a gaseous mixture. A

nonconductive, nonporous probe having a thin film of relatively nonconductive liquid thereon is placed in the gaseous mixture. The liquid film is capable of absorbing the particular gas to thereby change the electrical conductivity of the liquid film. The electrical conductivity of the film is measured to determine the concentration of the particular gas in the mix-



ture. Preferably the probe is a generally U-shaped glass rod having a roughened exterior surface to aid in retaining the thin film of liquid thereon. The apparatus and process is especially effective to detect and measure the amount of ammonia vapor in the air, using distilled water to form the thin liquid film. As a result, ammonia in solution is readily measured by measuring the vapor in proximity to the solution.

3,579,098

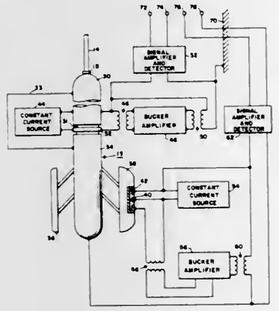
METHOD AND COMBINATION WELL-LOGGING APPARATUS FOR CONDUCTING BOTH DEEP AND SHALLOW INVESTIGATION OF THE FORMATIONS SURROUNDING A BOREHOLE

Marcel L. Mougne, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 24, 1968, Ser. No. 770,221

Int. Cl. G01v *3/18*

U.S. Cl. 324—10 **9 Claims**



The well-logging instrument comprises, essentially, a focus section have a focus upper guard, a center electrode and lower focus guard. The bottom section of the instrument includes a pad device having a minifocus central button electrode and rings around the central button which serve as microguards. The remote electrode of the focus portion of the instrument is the armor surrounding the logging cable. The lower focus guard serves a dual function in that it is also the minifocus remote electrode. Means are provided for measuring the potential between the focus guard and the cable armor and also between the microguard and the lower focus guard, both measurements then being sent up the logging cable to the surface electronics.

3,579,099

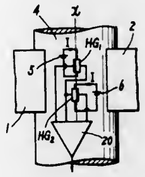
IMPROVED FLAW DETECTION APPARATUS USING SPECIALLY LOCATED HALL DETECTOR ELEMENTS

Takayuki Kanbayashi, 552 Niina, Minoo, Japan

Continuation-in-part of application Ser. No. 598,457, Dec. 1, 1966, now abandoned. This application June 5, 1969, Ser. No. 830,624

Int. Cl. G01r *33/12*

U.S. Cl. 324—37 **7 Claims**



A pair of Hall generator elements are symmetrically mounted in the same magnetic plane closely adjacent a material surface of substantially circular cross section, one Hall generator element being mounted on each side of a null plane, to detect the variations in leakage flux emanating from the material surface as the material is spirally rotated past the Hall generator elements. The Hall generator elements are symmetrically mounted on an axis intersecting a line parallel to the longitudinal axis of the material by approximately 5° and a control current provided to each Hall generator element of the same magnitude but different polarity. The Hall generator elements are, alternately, mounted astride the null plane to be substantially nearly aligned with the null plane and the control current to each Hall generator element is of the same magnitude and polarity.

ERRATUM

For Class 324—51 see:
Patent No. 3,579,280

3,579,100

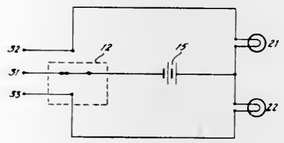
FLASHLIGHT ADAPTED FOR SHORT CIRCUIT TESTING

Palmer R. Lauver, 416 N. Second St., Sunbury, Pa.

Filed May 14, 1969, Ser. No. 824,528

Int. Cl. G01r *31/02*

U.S. Cl. 324—53 **4 Claims**



An apparatus is disclosed comprising a flashlight having two bulbs at the light-emitting end, and equipped with a three-pronged adapter at the rearward end. The two bulbs are wired through the batteries and a two position switch such that a short circuit between any pair of terminals of a three-terminal socket is detected by a specific pattern of energized bulbs.

3,579,101

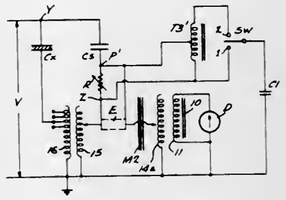
ALTERNATING CURRENT APPARATUS FOR MEASURING CAPACITANCE OR PHASE ANGLE

Norbert L. Kusters, and William J. M. Moore, Ottawa, Ontario, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Ontario, Canada

Filed Apr. 24, 1969, Ser. No. 819,029

Int. Cl. G01n *11/52*

U.S. Cl. 324—60 **7 Claims**



Apparatus of the current comparator type employs a magnetic core, with detection and compensating windings around the core shielded by a further magnetic core from outer ratio windings. A first series circuit is formed with one ratio winding and a capacitor to be measured; a second series circuit with the second ratio winding, a standard capacitor and a variable resistor. The series circuits are connected in parallel across an alternating potential with the currents in the ratio windings in opposition to generate only a difference flux in the cores. Turns of the compensating winding equal in number to the turns of the second ratio winding are connected in a closed series circuit with a third capacitor and a voltage proportional to the voltage drop across the resistor. Balance is detected by zero output from the detection winding. In-phase adjustment is obtained by varying the number of turns in the second ratio winding and hence in the compensating winding. Quadrature adjustment is achieved by the resistor.

3,579,102

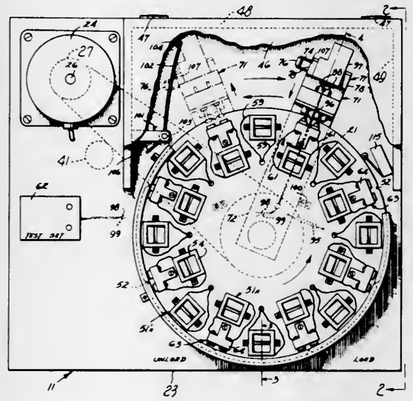
APPARATUS FOR TESTING SUCCESSIVE ONES OF A PLURALITY OF ELECTRICAL COMPONENTS

John F. Keating, Fanwood, and Joseph A. Zutkis, Mountainside, N.J.

Filed Sept. 30, 1968, Ser. No. 763,690

Int. Cl. G01r *15/12*

U.S. Cl. 324—73 **2 Claims**



A turntable, having a plurality of pairs of test sockets, is moved rotatably through a load station where relays are placed in the sockets. As the turntable is moved rotatably in a first direction, each pair of relays is aligned successively with a test device, which is then locked against the turntable and connected electrically to the relays to test the relays. After a predetermined rotation of the test device with the turntable, the test device is disengaged from the turntable and is urged in a second direction to engage the next successive pair of relays.

3,579,103

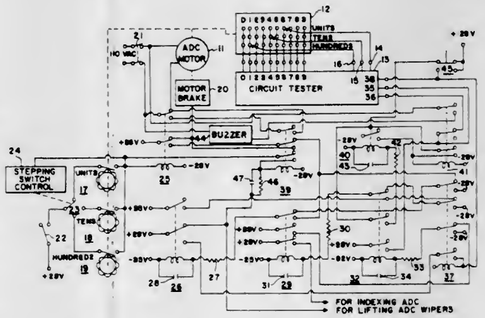
ANALOG-TO-DIGITAL CONVERTER TESTER

Charles H. Russell, Newport News, Va., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 6, 1969, Ser. No. 863,913

Int. Cl. G01r *15/12*

U.S. Cl. 324—73 **10 Claims**



Apparatus for automatically testing an ADC for open and short circuits. A tester is connected to the contacts on the ADC shaft. The ADC motor turns the ADC shaft to a specific setting and in response to this setting means are provided for stopping the motor and producing a signal having a predetermined duration which is applied to the tester. The tester, in response to this signal, performs the open and short circuit tests for the specific setting of the ADC shaft. If there are no open or short circuits, the tester produces another signal which causes the ADC motor to turn the ADC shaft to another specific setting for testing. If there is an open or short circuit, the tester does not produce said another signal and a buzzer sounds. The operator can then look at lights on the tester to determine where the open or short circuit is located.

3,579,104

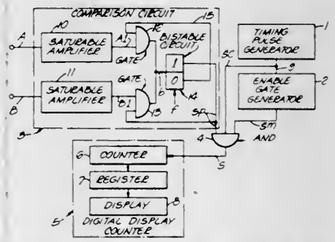
DIGITAL PHASE METER WITH COMPENSATING MEANS FOR ASYMMETRIC WAVEFORM DISTORTION

Jean Pignard, Annecy, and Bernard Wintz, Cessenaz, France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 21, 1969, Ser. No. 817,968

Int. Cl. G01r *25/00;* **G04f** *9/00, 11/06*

U.S. Cl. 324—83D **6 Claims**



A phase-measuring instrument for waves of the same frequency is shown in basic form, in which a digital phase shift (or phase delay) reading is obtained and which may be

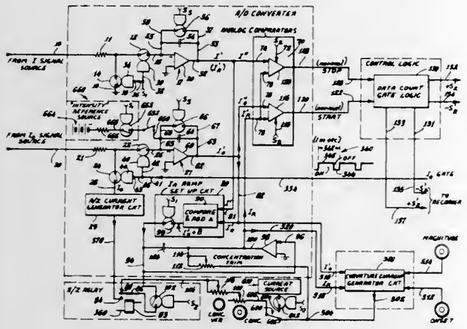
precalibrated to read numerically in degrees or fractional parts of degrees or radians. A short, basic timing (clock) pulse is first generated every time interval T_0, and these are counted down also to form an enabling gate of very long duration compared to T_0. A coincidence circuit generates a phase delay gate equal in duration to the time between positive-going zero crossovers of two waveforms of the same frequency to be measured. This phase delay gate and the aforementioned basic timing pulses and enabling gates are supplied to the three inputs of a coincidence circuit which operate to pass said timing pulses in bursts equal in duration to said phase delay gates, only when all three of said coincidence circuit inputs are present. A counter then evaluates each of said bursts, providing said digital readout.

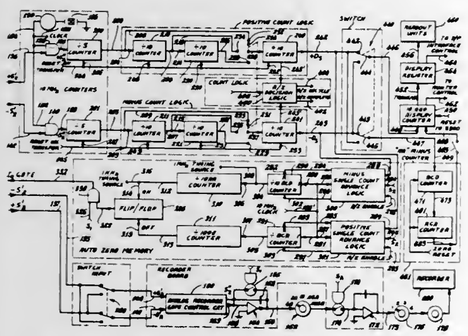
In more sophisticated form, the device takes an average reading between positive-going edges for half of a measurement cycle and between negative-going edges for the other half measurement cycle. Also included as refinements are circuits for avoiding erroneous reading in cases of such severe wave distortion that the positive half wave of the first wave begins before, but ends after, the positive half wave of the second wave.

3,579,105
DIGITAL READOUT SYSTEM HAVING AN AUTOMATIC ZERO-SETTING CIRCUIT

Larkin B. Scott, Fort Worth, Tex., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 3, 1969, Ser. No. 803,723
Int. Cl. G01r *17/06, 1/02*
U.S. Cl. 324—99 **18 Claims**



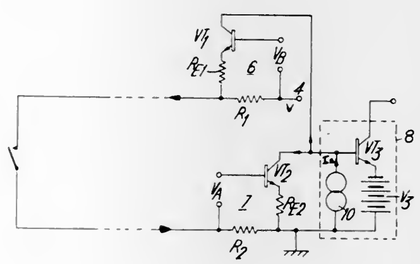


A digital measuring circuit for determining a desired mathematical relationship between a first variable input signal and a second relatively constant "reference" signal includes in addition to the main or computing mode of operation, a second mode of operation for automatically recalibrating the computing circuit. The automatic recalibration is accomplished by supplying at the first input (where the normally variable signal would be applied) a "blank" input which is "expected" to be equal to the second "reference" input. The automatic recalibration circuit mode then causes a change in the effective amplitude value (as by attenuation, for example) of the "reference" signal, so as to create a balance or calibration between the "blank" first signal and the changed "reference" signal (for example making them equal). A "memory" stores the type of change (e.g., the attenuation factor of the "reference" input) necessary to create this balanced condition, and this stored calibration information is utilized during the normal computing mode so as to automatically calibrate out any systematic and other errors, even if they originate in the remote effective sources of either of the first variable signal or of the second "reference" signal. The circuit is disclosed in an exemplary embodiment particularly adapted to measuring the relative intensities of the "sample" and the "reference" beam intensities of a double-beam absorption spectrophotometer. In this exemplary usage, the computed relationship is the logarithm of the ratio of the reference beam intensity to that of the sample beam intensity, and the automatic calibration is accomplished (in a linear mode) by causing the "reference beam" intensity signal to be made equal to a "blank" first signal representing the intensity of the "sample beam" when no absorbing sample material is actually present in this beam. In such an environment, the computed logarithm of the ratio of the two signals may be obtained directly in "absorbance" units, or by further (manual) calibration of the computing circuit directly in terms of the concentration of the (absorbing component of the) sample material.

3,579,106
LOOP CURRENT DETECTOR

Michael Robert Lord, Basildon, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 14, 1968, Ser. No. 775,600
Claims priority, application Great Britain, Nov. 30, 1967, 54588/67
Int. Cl. G01n *7/00*
U.S. Cl. 324—140 **5 Claims**

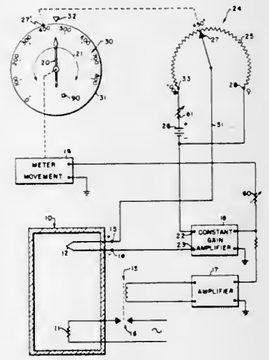


A detector circuit for detecting current changes in a loop circuit. The currents in both legs of the loop are amplified independently and thereafter combined. The combined current is compared against a reference current to produce an output signal when the combined current exceeds the reference current by a predetermined amount sufficient to bias a threshold network.

3,579,107
INDICATING CONDITION CONTROLLER HAVING A FACE INCLUDING A ROTATABLE SCALE PLATE COOPERATING WITH A WIDE ANGLE 250° METER

Edward W. Buttenhoff, Excelsior, and Lyman L. Hill, Jr., St. Paul, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Continuation-in-part of application Ser. No. 752,005, Aug. 12, 1968, now abandoned. This application Dec. 23, 1968, Ser. No. 795,386
Int. Cl. G01n *17/00*
U.S. Cl. 324—157 **10 Claims**

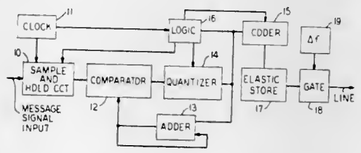


An indicating temperature controller for use in controlling the temperature of an area and indicating the temperature of the area, the controller including a variable magnitude setpoint voltage source which is compared to a thermocouple voltage to originate an error voltage. A scaleplate carries a circular temperature scale. Manual rotation of the scaleplate rotates the temperature scale about an axis. A meter whose pointer is at rest (zero energization) at a position between extremities of movement is energized by the error voltage and has a pointer which rotates about the axis and is capable of swinging through an arc substantially equal to the arc length of the temperature scale. The setpoint voltage source includes a potentiometer. The scaleplate is coupled to rotate as the potentiometer wiper moves, so that the rest position of the pointer indicates the setpoint temperature and the pointer position indicates the thermocouple temperature. The potentiometer may be a potentiometer having a circular resistance element whose arc length is also substantially equal to the arc length of the temperature scale, or a multiturn potentiometer.

3,579,108
DIFFERENTIAL CODER AND DECODER

Cassius C. Cutler, Holmdel, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Nov. 29, 1968, Ser. No. 779,859
Int. Cl. H04b *1/02, 1/06*
U.S. Cl. 325—38 **22 Claims**

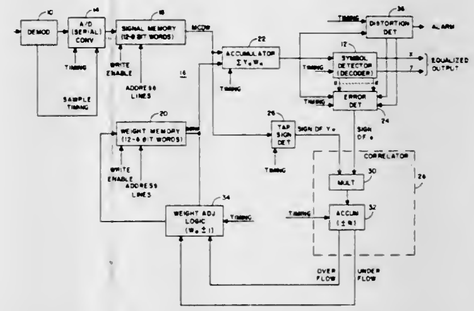


A differential coding system is proposed which, when the slope of the message signal to be coded is large, accelerates the production of the output of a quantizer which is used to encode the message signal. A digital coder and elastic store are interposed between the quantizer and transmission line to insure that the digitally coded signal is transmitted at a desired line rate while the production of those digital signals may be significantly greater than the line rate. A decoder is utilized at the receiver which functions in the inverse manner and enables the coded message signal to be decoded.

3,579,109
AUTOMATIC EQUALIZER FOR DIGITAL DATA TRANSMISSION SYSTEMS

Derek J. Hatley, Monroe, N.Y., assignor to General Dynamics Corporation

Filed Apr. 2, 1969, Ser. No. 812,691
Int. Cl. H03k *13/34*
U.S. Cl. 325—42 **21 Claims**

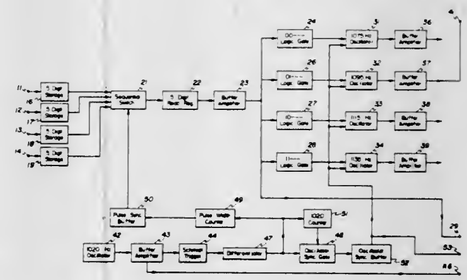


An adaptive equalizer is described wherein the data signal received from a line is digitized and is digitally corrected on a serial bit-by-bit basis so as to compensate for any distortion introduced by the transmission channel.

3,579,110
DIGITAL DATA CONDENSATION SYSTEM

Erwin J. Hauber, 1316 Lindenwood Drive, El Cajon, Calif.

Filed Sept. 20, 1968, Ser. No. 761,143
Int. Cl. H04j *3/04*
U.S. Cl. 325—47 **4 Claims**

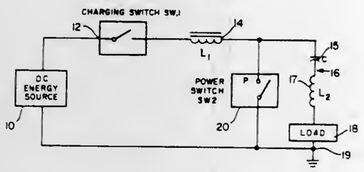


A digital data condensation system for simultaneously transmitting and receiving a plurality of digital data signals on a bandwidth which normally accommodates only one such signal by sequentially converting the intelligence of a plurality of binary codes into a plurality of fixed frequencies and phases; transmitting a carrier frequency modulated by the plurality of fixed frequencies and phases; receiving and detecting the fixed frequencies and phases; reconverting the fixed frequencies and phases into binary intelligence by comparing the received fixed frequencies and phases with fixed frequencies and phases synchronously generated in the receiver and reading out of original binary intelligence.

3,579,111
RADIO FREQUENCY PULSE GENERATOR USING DC CHARGING

Paul R. Johannessen, Lexington, and Thorleif Knutrud, Sundbury, Mass., assignors to Sylvania Electric Products Inc.

Filed Oct. 29, 1969, Ser. No. 872,318
Int. Cl. H04b *1/04*
U.S. Cl. 325—141 **5 Claims**

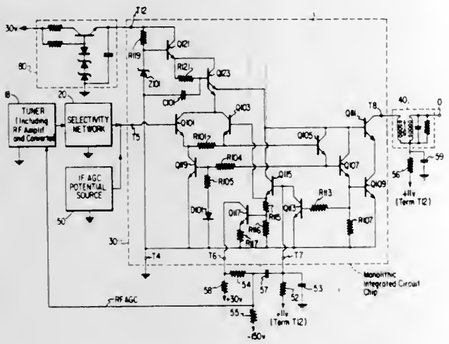


A radiofrequency generator employing a charging inductor connected to a source of direct current (DC) energy through a charging switch. The capacitor of a radiofrequency (RF) tank circuit cooperates with the charging inductor to achieve resonant charging of the RF tank circuit. A power switch is closed causing the charged tank circuit to oscillate at its natural resonant frequency through a series-connected load.

3,579,112
AUTOMATIC GAIN CONTROL SYSTEMS

Jack R. Harford, Flemington, N.J., assignor to RCA Corporation

Filed Mar. 3, 1969, Ser. No. 803,728
Int. Cl. H03g *3/30*
U.S. Cl. 325—319 **10 Claims**

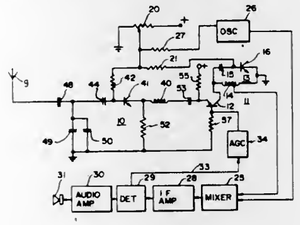


In a superheterodyne receiver, IF output of tuner, together with an IF AGC bias potential, are applied via a dynamic attenuator network to an IF amplifier input electrode. Delay transistor, biased into saturation, holds off (a) a transistor serving as the active device of the attentuator network, and (b) a transistor serving as an RF AGC drive transistor, over a first range of received signal levels below a first threshold level. AGC bias variations applied to amplifier input electrode varies IF amplifier gain without affecting IF attenuator or tuner in the first range. At a given AGC bias level (to which delay transistor base is responsive) delay transistor comes out of saturation and its collector potential (to which the bases of attenuator and RF AGC transistors are responsive) varies inversely with AGC bias. At first threshold level, delay transistor collector potential departs sufficiently from saturation potential to initiate RF AGC transistor conduction, and RF AGC action commences. A full range of RF AGC action is traversed before delay transistor collector potential arrives at level-initiating attenuator transistor conduction. Beyond this second threshold level, attenuator action occurs and a negative DC feedback loop is closed which holds IF amplifier bias relatively constant. Receiver signal control thus follows sequence including at least three phases: (1) a weak-signal phase, wherein AGC action is confined to IF amplifier gain variations; (b) a medium-signal phase, wherein IF amplifier gain variations are accompanied by RF amplifier gain variations; and (c) a strong-signal phase, wherein control is confined essentially to IF attenuator action.

3,579,113
ANTENNA COUPLING CIRCUIT

Kamil Y. Jabbar, River Grove, and Ole K. Nilssen, Bensenville, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Mar. 14, 1969, Ser. No. 807,372
Int. Cl. H04b *1/18*
U.S. Cl. 325—376 **7 Claims**

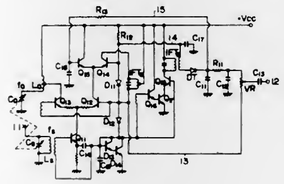


A high impedance capacitive antenna is coupled in series with a low impedance resistive load in the form of the input circuit of an RF transistor amplifier through a series-tuned circuit including a varactor diode connected in series with an inductor. A source of DC biasing potential is provided to vary the biasing voltage on the diode in order to change its capacitance to tune the circuit over a predetermined band of frequencies. The circuit operates to transfer constant power at constant bandwidth from the antenna to the load over a wide range of frequencies, utilizing only a restricted range of capacitance change of the diode capacitance.

3,579,114
AUTOMATIC GAIN CONTROL SYSTEM RADIO RECEIVERS AND THE LIKE

Tokinori Kozawa, Kokubunji-shi; Noboru Kuzuma, and Ichiro Miwa, Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo-to, Japan

Filed July 24, 1968, Ser. No. 747,237
Claims priority, application Japan, Aug. 21, 1967, Sept. 18, 1967, 42/53259; 42/59449
Int. Cl. H04b *1/16*
U.S. Cl. 325—410 **14 Claims**

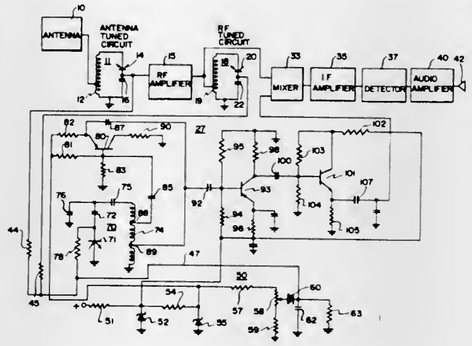


One of a pair transistors forming a differential-type amplifier and controlled by an additional transistor whose collector is connected with the common emitters of the pair of transistors, is controlled by an automatic gain control signal obtained from the output of a semiconductor detection device, so as to adjust the current flow through the other one of the pair of transistors. The potential difference between the respective bases of the pair of transistors is defined by the offset voltage across the semiconductor detection device, thereby the operating point of the differential-type amplifier can be determined adequately.

3,579,115
ELECTRONICALLY TUNED OSCILLATOR

Nikolai Goncharoff, Roselle, and Kamil Y. Jabbar, River Grove, Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 11, 1969, Ser. No. 798,292
Int. Cl. H04b *1/26*
U.S. Cl. 325—438 **11 Claims**

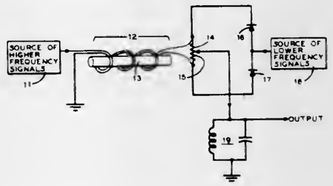


An electronically tuned oscillator for use as a local oscillator in an AM radio receiver includes a transistor as the active component, with the emitter-base circuit of the transistor being supplied with signals obtained from two taps on the coil of the tank circuit of the oscillator. The tank circuit is tuned by use of a varactor or hyperabrupt diode supplied with tuning voltages obtained from a potentiometer connected across a DC source. The collector of the transistor is connected through a resistor to ground potential, and the taps are located to cause the reflected capacitance from the transistor across the tuning diode to be minimized, while at the same time providing sufficient energy to drive the transistor. The output of the transistor then is AC-coupled to a transistor amplifier stage which is AC-coupled to an emitter follower, the output of which supplies the oscillator signals to a mixer circuit in the radio receiver.

3,579,116
FREQUENCY MIXER

Herbert Knirsch, Erding, Klettham, Germany, assignor to Schlumberger overseas Messgeratebau und Vertrieb G.m.b.H., Munich, Germany

Filed Dec. 10, 1968, Ser. No. 782,687
Int. Cl. H04b *1/26*
U.S. Cl. 325—439 **5 Claims**

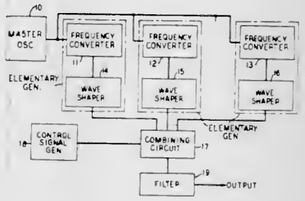


A frequency mixer for mixing two time-varying input signals of substantially different dominant frequencies has the signal of higher frequency applied to an impedance having two ends connected in a circuit with two assymetrically-conductive, nonlinear elements. These elements serve to mix the higher frequency signal with the signal of lower frequency, the two elements being poled in the same current-conducting direction and the latter signal being applied to a junction intermediate the two elements. The higher frequency signal is applied to the two ends of the impedance by a balun comprising two parallel conductors wound upon a high-frequency transformer element; one end of the conductor receiving the signal of higher frequency and the other end being connected to ground potential which traces through to a corresponding end of the impedance. A circuit tuned to a desired sum or difference frequency has s signal output end connected to a point on the impedance between the two ends thereof.

3,579,117
WAVEFORM GENERATOR

Walter E. Norris, Ballardvale, Mass., and Stephen D. Shoap, Matawan, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Sept. 27, 1968, Ser. No. 763,301
Int. Cl. H03k *5/08*
U.S. Cl. 328—27 **4 Claims**

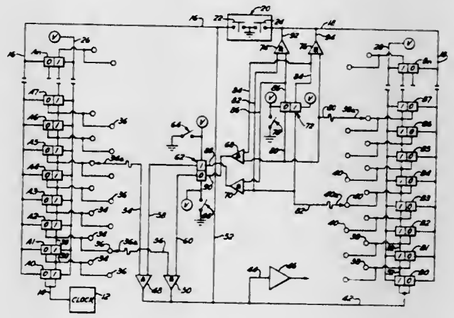


A method and apparatus for time-domain generation of an approximation to an ideal waveform for signaling synchronously via a bandlimited transmission facility is disclosed. The method, which consists of serially gating appropriate waveform segments so as to achieve the desired composite waveform, presents the advantage over prior art that time-domain techniques are invoked in the task of waveform generation, to supplement the work of frequency-domain techniques (filtering).

3,579,118
MULTIPLE MODE FREQUENCY DIVIDER CIRCUIT

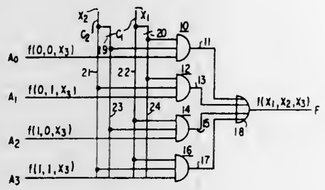
Donald F. Rhodes, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sept. 26, 1969, Ser. No. 861,382
Int. Cl. H03k *21/00*
U.S. Cl. 328—41 **10 Claims**



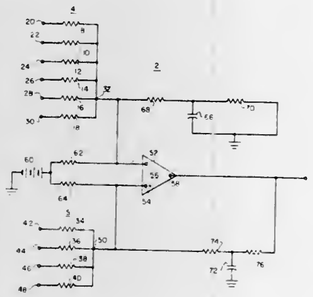
Providing various frequency and pulse repetition combinations, including single frequency, and two predetermined numbers of output pulses at each of two frequencies comprising a first cascade of flip-flops fed from a pulsing clock with means to tap two selected flip-flops in the cascade to set the two output frequencies. A second similar cascade of flip-flops includes means to set the two predetermined numbers of pulses. The two cascades are interconnected by means including control flip-flops, whereby switching from one to the other settings on, and resetting of both arrays, are accomplished.

3,579,119
UNIVERSAL LOGIC CIRCUITRY HAVING MODULES WITH MINIMUM INPUT-OUTPUT CONNECTIONS AND MINIMUM LOGIC GATES
Sik-Sang Yau, and Calvin K. Tang, Evanston, Ill., assignors to Northwestern University, Evanston, Ill.
Filed Apr. 29, 1968, Ser. No. 724,701
Int. Cl. H03k *19/00, 19/12, 19/20*
U.S. Cl. 328—92 **21 Claims**



Universal logic circuitry for a large number of variables using identical universal logic circuits of a small number of variables having a minimal number of logic gates and input-output circuits as modules in a multilevel arrangement.

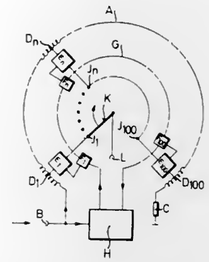
3,579,120
SELF-TESTING LOGIC GATE
Peter Curran, Hastings-on-Hudson, N.Y., and John Delistovich, Jersey City, N.J., assignors to The Bendix Corporation
Filed Mar. 28, 1969, Ser. No. 812,575
Int. Cl. H03k *19/00, 5/20*
U.S. Cl. 328—92 **5 Claims**



A self-testing logic gate used in redundant control systems performs logic functions on AC coded input signals by means of an input resistor network and a differential amplifier having inverting and noninverting inputs. The amplifier is responsive to the AC inputs for providing a square wave output and when a logic circuit failure occurs, normally balanced DC amplifier inputs are unbalanced so that the amplifier provides a steady state DC output.

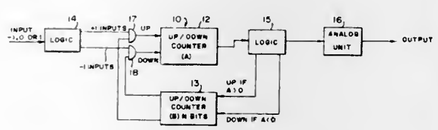
3,579,121
APPARATUS FOR DETECTING NONRECURRENT PULSES IN THE NANOSECOND RANGE WITH A DELAY LINE
Eugen Haag, Karlsruhe, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Jan. 15, 1969, Ser. No. 791,463
Claims priority, application France, Feb. 16, 1968, 140,140
Int. Cl. G11c *11/26*
U.S. Cl. 328—124 **11 Claims**

An apparatus for obtaining, with a delay, amplitude values of a nonrecurrent signal pulse of a duration in the nanosecond or subnanosecond range. The signal pulse is applied to a delay line having a plurality of spaced taps, to each of which there is connected a sampling station. Entering the delay line, the signal pulse triggers a scanning signal that travels along a scanning signal path with a speed different from the speed of the signal pulse traveling in the delay line.



Thus, the scanning signal either overtakes or falls behind the signal pulse and during such a relative travel it scans the signal pulse and causes storing of individual amplitude values in said sampling stations from which the stored values may be sequentially picked up for a visible recording of the signal pulse curve.

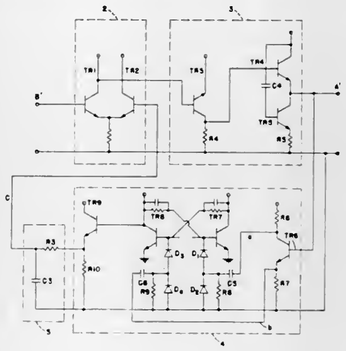
3,579,122
DIGITAL FILTER FOR REDUCING SAMPLING JITTER IN DIGITAL CONTROL SYSTEMS
Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Tage O. Anderson, Arcadia, and William J. Hurd, La Canada, Calif.
Filed Dec. 23, 1969, Ser. No. 887,701
Int. Cl. H03k *21/18*
U.S. Cl. 328—167 **10 Claims**



A digital filter comprising two up-down counters A and B. Counter A which is responsive to a sampled input signal which is quantized into three levels +1, −1 and 0, is incremented in response to each +1 input, decremented in response to each −1 input, and remains unchanged in response to a 0 input. Counter B, which includes N stages, is incremented at each sampling time when A is positive, decremented when A is negative and remains unchanged when A is zero. When B overflows in a positive direction A is decremented by one while a negative overflow of B results in A being incremented by one. The filter output is $+2^{1N}$ when A is positive, -2^{1N} when A is negative and zero (0) when the count in A is zero.

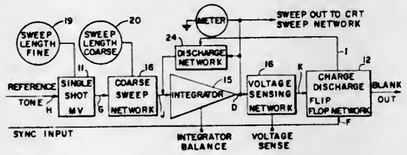
3,579,123
DC RESTORER APPARATUS
Hirotoshi Koga, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan
Filed Aug. 21, 1969, Ser. No. 851,991
Claims priority, application Japan, Aug. 23, 1968, 43/59899
Int. Cl. H04b *1/12*
U.S. Cl. 328—164 **9 Claims**

DC restorer apparatus is provided in accordance with the teachings of the present invention for restoring the DC and low frequency components to a pulse train received in a facsimile or data transmission system. The DC restorer apparatus provided comprises adder means for summing first and second input signals applied thereto and for providing an output signal representative of the received pulse train with the DC and low frequency components restored thereto. The adder means is adapted to have the received pulse train applied to the first input thereof while the output of a feedback loop, which includes both bistable circuit means and low-pass



filter means, is applied as the second input thereto. The bistable circuit means is adapted to be driven by the output produced by such adder means and the output of the bistable circuit means is applied through the low-pass filter means to the second input of said adder means. The filtered output of the bistable circuit means is thus added to the received pulse train whereby the DC and low frequency components thereof are restored.

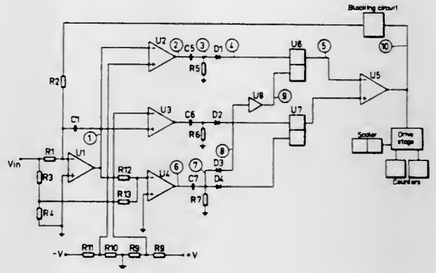
3,579,124
COMPENSATED SWEEP GENERATOR
John Henry O'Hara, Bowie, Md., assignor to The United States of America as represented by the Secretary of the Army
Filed May 12, 1969, Ser. No. 823,911
Int. Cl. H03k *4/10, 4/86*
U.S. Cl. 328—181 **8 Claims**



An apparatus for generating a frequency-compensated sweep. A signal containing wow and flutter deviations is applied to the input of the generator, wherein these deviations are compensated for by increasing or decreasing the instantaneous value of the sweep voltage. An integrator portion of the generator generates the compensated sweep. The output of the integrator is a stairstep voltage, the rate of change of voltage varying as the input frequency varies with wow and flutter. The generator compensates for instantaneous variations in the time base due to wow and flutter by generating a time base that is a function of the wow and flutter. Either the number, amplitude, or width of the input pulses may be changed to vary the time base.

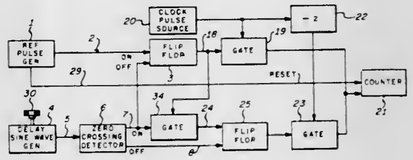
3,579,125
APPARATUS FOR RESETTING AN ANALOG INTEGRATOR
Lars A. Lindblad, Klingen, and Rune N. Kahlbom, Uplands Vasby, Sweden, assignors to Junger Instrument Aktiebolag, Stockholm, Sweden
Filed Nov. 25, 1968, Ser. No. 778,658
Int. Cl. G06g *7/18*
U.S. Cl. 328—127 **1 Claim**

Apparatus for resetting an analog integrator with digital readout capability. The resetting signal, which discharges the integrating capacitor, is terminated when the output of the integrator reaches a level which is proportional to the analog input signal instead of completely discharging the integrating capacitor. This compensates for the errors present in prior art analog integrators caused by ignoring the analog input



signal during the discharge time of the integrating capacitor. During the discharge of the integrating capacitor, an operational amplifier compares the integrator output voltage with a signal proportional to the analog input signal, called the compensating voltage. When two signals are equal the resetting signal is terminated.

3,579,126
DUAL SPEED GATED COUNTER
John J. Paul, Montreal, Quebec, Canada, assignor to Sperry Rand Canada Limited, Toronto, Ontario, Canada
Filed Oct. 17, 1968, Ser. No. 768,487
Claims priority, application Canada, Aug. 29, 1968, 028,840
Int. Cl. H03k *17/28*
U.S. Cl. 328—129 **4 Claims**

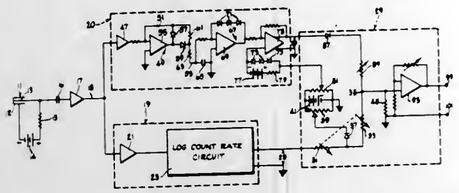


Counting apparatus for determining the elapsed time between a reference pulse and the next following positive peak of a delayed sine wave irrespective of the DC level of the sine wave. The apparatus comprises a clock pulse source producing full rate and half rate pulses which are applied through respective gates to a single pulse counter. The first (full rate) gate is turned on by the reference pulse and is turned off upon the first following positive-going crossover of the delayed sine wave. The second (half rate) gate is turned on simultaneously with the termination of the first gate and is turned off upon the next following negative-going crossover of said delayed sine wave.

3,579,127
APPARATUS FOR MONITORING PULSES
Harold A. Thomas, San Diego, Calif., assignor to Gulf Energy & Environmental Systems, Inc., San Diego, Calif.
Filed May 31, 1967, Ser. No. 642,390
Int. Cl. G06g *7/24;* **G01t** *1/15*
U.S. Cl. 328—145 **5 Claims**

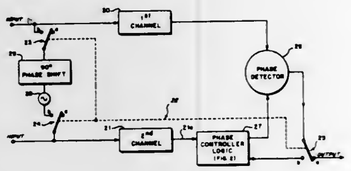
Apparatus is described for producing an output signal generally proportional to the log of the rate of random pulses, which rate varies over a total pulse-rate range of sufficient magnitude as to require at least two different monitoring techniques. Means utilizing the respective techniques are provided for producing log signals representing the pulse rate

of the random pulses in lower and upper portions of the total pulse-rate range. The log signals representative of the pulse rate in the respective ranges are adjustable to have the same



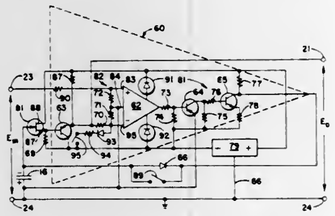
proportional relation to the log of the pulse rate. The relative amplitudes of the two log signals are also adjustable such that a continuous and coherent output may be provided over the total pulse-rate range.

3,579,128
PHASE CONTROLLER
Ervin Smith, Timonium, and John O. Wedel, Baltimore, Md.
Filed Feb. 12, 1969, Ser. No. 798,658
Int. Cl. H03b *3/04*
U.S. Cl. 328—155 **5 Claims**



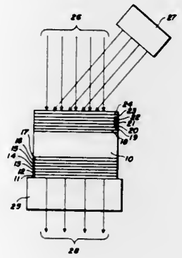
The subject disclosure relates to novel and improved apparatus for detecting and nulling the difference in phase between a pair of electrical operational channels. The apparatus includes a signal generator which applies a test signal to each operational channel, a phase detector coupled to the output of the channels, an analog to digital converter that converts the detected phase difference into a count in and up and down counter circuit and switching devices that in response to the output of the counter couple phase shift elements into one of the channels so as to equalize the phase between the two channels.

3,579,129
VOLTAGE-HOLDING CIRCUIT AND METHOD
Robert G. Irvine, Claremont, Calif., assignor to LTV Ling Altec, Inc., Anaheim, Calif.
Filed Apr. 25, 1969, Ser. No. 819,380
Int. Cl. H03f *3/16, 5/00*
U.S. Cl. 330—3 **11 Claims**



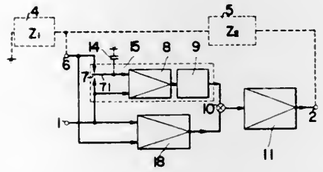
A voltage-holding circuit for sampling a signal voltage at a given instant or at the peak of the voltage and for holding the sampled or peak voltage for an extended period of time; and a method for holding a peak or sampled voltage for an extended period of time.

3,579,130
THIN FILM ACTIVE INTERFERENCE FILTER
Vern N. Smiley, San Diego, Calif.
Filed July 18, 1969, Ser. No. 842,917
Int. Cl. H01s *3/05*
U.S. Cl. 330—4.3 **6 Claims**



A thin film of active laser material having a thickness of an integral number of one-half wavelengths of the laser emission energy is disposed between two multilayer films having high reflectance properties relative to the wavelength of energy emitted by the active laser material while offering relatively good transmittance to a source of energy directed to the active laser material to raise its energy level. The multilayer films are each comprised of a number of layers alternating in high and low index of refraction and having a thickness of the order of one-quarter wavelength of the emitted laser energy. The multilayer high reflectance films disposed on either side of the thin film of active laser material may be supported on an appropriate substrate and the assembly is positioned in the path of an input signal which it is desired to filter and amplify as well as in the path of a source of excitation energy to produce an output signal commensurate in frequency with a known or determinable component of the input signal and in amplified form.

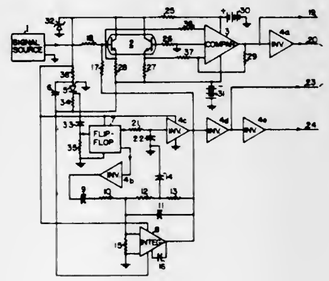
3,579,131
OPERATIONAL AMPLIFIER
Toshio Fukuda, Takatsuki, Osaka, Japan, assignor to Shimadzu Seisakusho Ltd., Nakagyo-ku, Kyoto, Kyoto-prefecture, Japan
Filed Oct. 8, 1968, Ser. No. 765,957
Claims priority, application Japan, Oct. 10, 1967, 42/65087
Int. Cl. H03f *1/02, 1/14*
U.S. Cl. 330—9 **1 Claim**

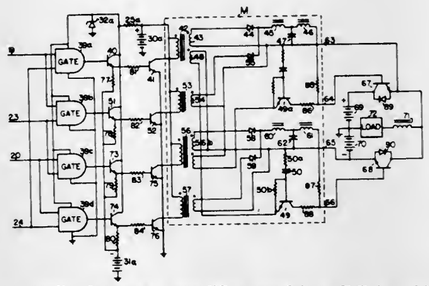


An operational amplifier for constituting an apparatus such as, for instance, an analog computer. The amplifier has a very high input impedance so that only a very low value of signal current is drawn from the signal source. A stationary component in the signal voltage appearing at the signal input terminal is amplified by a chopper-stabilized direct-current amplifier having a chopper and a synchronous demodulator,

and then is applied to a feedback point located at the junction between the two operational impedances, after passing through a direct-coupled amplifier. The voltage at the feedback point is equilibrated to the input signal applied to the input signal terminal by feedback action, and in reaction to this equilibrium value, output voltage is taken out at the output terminal. Since the input signal current is not taken directly into the operational impedance, but is led to an amplifier of high input impedance, the input impedance can be made extremely high, resulting in increasing the precision of mathematical operations.

3,579,132
CLASS "D" LINEAR AUDIO AMPLIFIER
James A. Ross, La Jolla, Calif., assignor to LTV Ling Altec Inc., Anaheim, Calif.
Filed Nov. 14, 1969, Ser. No. 876,771
Int. Cl. H03f *3/38*
U.S. Cl. 330—10 **14 Claims**

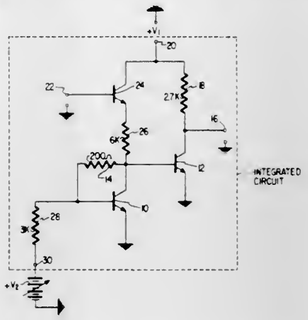




An audio frequency amplifier, useful to DC in which a pulse-width modulated signal is formed from the audio frequency signal. Each excursion of the pulse-width signal is cut in half with respect to time by an appropriately timed square-wave and plural logic gates. The resulting waveforms are passed without distortion by pulse transformers. Plural rectifiers and low-pass filters re-form the pulse-width modulated signal. This signal is impressed upon switching power transistors. These give a greatly amplified power output, which is the same type of amplitude-varying waveform as the input audio signal, upon the current flowing through a small choke to the load. The load may have any phase angle without incurring distortion of the output waveform. Half-bridge, quarter-bridge, full-bridge, and plural phase embodiments are described.

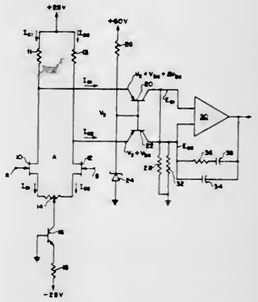
3,579,133
SIGNAL TRANSLATING STAGE
Jack R. Harford, Three Bridges, N.J., assignor to RCA Corporation
Filed Jan. 29, 1969, Ser. No. 794,973
Int. Cl. H03f *3/42;* **H03g** *3/30*
U.S. Cl. 330—19 **9 Claims**

A signal translating stage especially suited for fabrication using integrated circuit techniques including a first transistor, the transconductance of which is adjusted to effect a desired attenuation of applied input signals in response to a controllable direct voltage applied to an included second transistor,



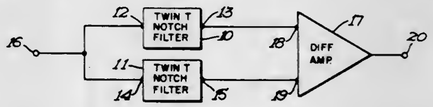
with the control voltage being applied in a manner to introduce a minimum of distortion in the attenuated signal over a wide control range.

3,579,134
SYSTEM FOR STABILIZING AN OPERATIONAL AMPLIFIER
Steven Morrison, Randallstown, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Oct. 17, 1969, Ser. No. 867,321
Int. Cl. H03f *5/00*
U.S. Cl. 330—3 **8 Claims**



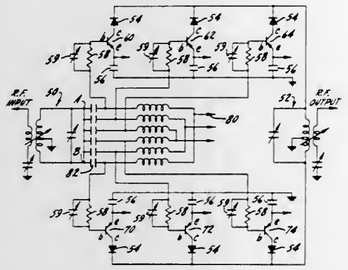
Described is a system for direct current stabilizing an operational amplifier by means of a field effect common source differential amplifier with a current sink which drives a matched pair of PNP transistors in the common base configuration.

3,579,135
FILTER NETWORK AND METHOD
Robert K. Anderson, Minneapolis, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.
Filed Dec. 31, 1968, Ser. No. 788,238
Int. Cl. H03f *3/68;* **H03h** *7/10*
U.S. Cl. 330—30 **1 Claim**



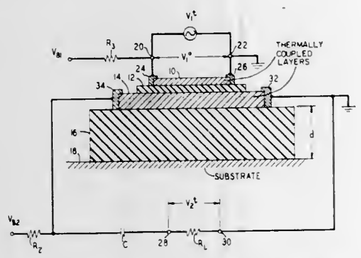
A filter network and method for the rejection of all but a selected band of frequency, the apparatus and method utilizing a pair of notch-type filters such as twin-T filters, with a common input connection and separate outputs connected to different inputs on a differential amplifier.

3,579,136
MULTI-STAGE POWER AMPLIFIER IN WHICH EACH STAGE CONDUCTS FOR ONLY A PREDETERMINED PORTION OF THE INPUT
George A. Machamer, 10401 S. State St., Chicago, Ill.
Filed Dec. 13, 1965, Ser. No. 513,405
Int. Cl. H03f *3/68*
U.S. Cl. 330—30 **7 Claims**



An amplifying circuit made up of a plurality of individual amplifying stages, each of which may have at least three elements. Each of the amplifying stages have a common input and a common output and the stages are so biased that each amplifying stage conducts for a different portion of the input cycle. Although the output wave form is the same as if only a single stage were used, by providing a plurality of stages, each of which conducts for only a portion of the input cycle, a substantially more efficient power amplifier is provided.

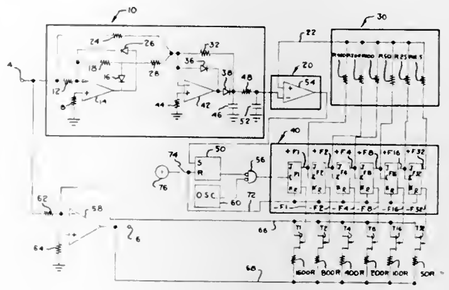
3,579,137
THIN FILM THERMAL DEVICE
Robert H. Walden, Scotch Plains, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Oct. 31, 1968, Ser. No. 772,335
Int. Cl. H03f *15/00*
U.S. Cl. 330—38 **5 Claims**



A thin film thermal device comprises an MIS structure fabricated on a low thermal conductivity insulator. A first DC bias and AC signal input are applied across the metal layer and a second DC bias is applied across, and the AC signal output taken from, the semiconductor layer. The device operates as an audio amplifier if the first DC bias current is greater than the second and operates as a frequency doubler if the first DC bias current is zero.

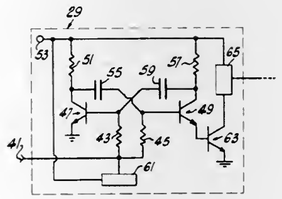
3,579,138
AUTOMATIC GAIN PRESETTING CIRCUIT
George J. Harris, Framingham, and Christopher C. Day, Newtonville, Mass., assignors to American Optical Corporation, Southbridge, Mass.
Filed Aug. 25, 1969, Ser. No. 852,635
Int. Cl. H03g *3/20*
U.S. Cl. 330—86 **13 Claims**

An automatic gain presetting circuit for adjusting the gain of an operational amplifier. A full-wave rectifier and peak detector determine the peak input. A counter is incremented continuously and a reference voltage is developed which increases with the increasing count. The reference voltage is compared with the detected peak voltage and when the reference voltage is equal to or greater than the peak input voltage the counter ceases to increment. A plurality of resistors are connectable in parallel in the feedback path of the



operational amplifier, but each individual resistor is connected in the feedback path only if a respective stage in the counter is in a predetermined state. The gain of the operational amplifier depends upon the total effective feedback impedance. The larger the final count in the counter, corresponding to a larger peak input signal, the smaller the total effective feedback impedance and the lower the gain of the amplifier.

3,579,139
HORIZONTAL CIRCUITRY FOR TELEVISION RECEIVERS
Dong Woo Rhee, Williamsville, N.Y., assignor to Sylvania Electric Products Inc.
Filed Aug. 17, 1967, Ser. No. 661,388
Int. Cl. H04l *7/04*
U.S. Cl. 331—8 **3 Claims**

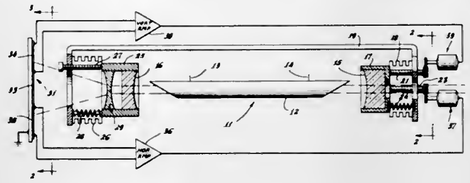


Transistorized horizontal oscillator and drive circuitry for a television receiver including a modified common emitter multivibrator with the emitter electrode of the multivibrator output transistor coupled directly to the base electrode of a drive transistor.

3,579,140
LASER
James M. Anderson, New Milford, and Marvin J. Fenton, Stamford, Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed Dec. 5, 1967, Ser. No. 688,204
Int. Cl. G01b *11/26;* **H01s** *3/00*
U.S. Cl. 331—94.5 **3 Claims**

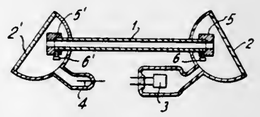
A continuous wave laser in which the end mirrors are automatically maintained in alignment. A four-quadrant detector is centered along the path of the emerging light beam. Misalignment of the end mirrors causes an axial shift in the direction of the light beam and produces output signals from

the four-quadrant detector from which can be determined the direction and amount of shift. These signals are used to



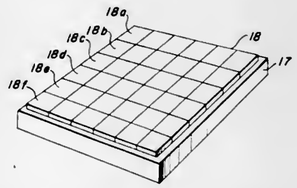
servocontrol the position of one of the mirrors so as to bring it back into alignment with the other mirror.

3,579,141
GAS LASER TUBE
Masao Miya, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan
Filed Jan. 30, 1969, Ser. No. 795,281
Claims priority, application Japan, Feb. 2, 1968, 43/6603
Int. Cl. H01s *3/22*
U.S. Cl. 331—94.5 **5 Claims**



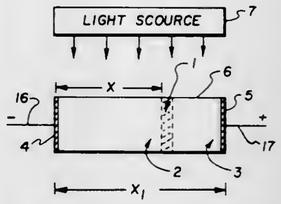
A gas laser device is described wherein a long life is obtained with the employment of a cathode and an anode. A gas filled tube is provided which at oppositely located ends has a cathode and an anode. A short hollow member, preferably of cylindrical shape, is seated on the ends of the gas filled tube. The member is made of a material selected to withstand the bombardment of discharge particles such as positive ions and electrons.

3,579,142
THIN FILM LASER
Vern N. Smiley, San Diego, Calif., assignor to the United States of America as represented by the Secretary of the Navy
Filed July 18, 1969, Ser. No. 842,938
Int. Cl. H01s *3/05*
U.S. Cl. 331—94.5 **11 Claims**



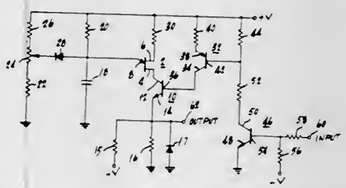
A laser assembly comprises a source of exciting or pumping energy, a thin film of laser material supported to intercept a path of the exciting energy, the film having a thickness of the order of one wavelength of the radiant energy emitted by the laser. The film is positioned at an angle relative to the exciting energy for producing a laser beam which is substantially perpendicular to the plane of the film and therefore a much larger aperture than had been realized with prior thin film lasing materials. In a preferred form, multilayer reflective coatings intensify and enchance the laser beam produced perpendicularly to the plane of the film.

3,579,143
METHOD FOR INCREASING THE EFFICIENCY OF LSA OSCILLATOR DEVICES BY UNIFORM ILLUMINATION
William H. Haydl, Tarzana, Calif., assignor to North American Rockwell Corporation
Filed Nov. 29, 1968, Ser. No. 780,037
Int. Cl. H03b *7/00*
U.S. Cl. 331—107G **3 Claims**



The frequency of oscillations can be controlled by applying uniform illumination to at least one surface of photoconducting semiconductors which exhibit a negative differential conductivity and traveling regions of space charge. The method is particularly useful in Gunn effect devices utilizing gallium arsenide (GaAs), but applies also to other photoconducting semiconductors exhibiting the Gunn effect and also to piezoelectric semiconductors exhibiting traveling domains due to acousto-electric interactions between acoustic waves and the charge carriers. Also described is a principle for reducing the fluctuations in the carrier density present in the crystalline semiconductor solid by reducing the inhomogeneities as a percentage of the total carrier density by uniformly illuminating the crystal. The reduction in the present fluctuations in the carrier density is of particular significance in gallium arsenide Gunn devices operating in the LSA mode.

3,579,144
RELAXATION OSCILLATOR SATED BY TRANSISTOR SWITCH
Michael Rotolo, Jr., Cherry Hill, N.J., assignor to RCA Corporation
Filed Mar. 19, 1969, Ser. No. 808,587
Int. Cl. H03k *3/26*
U.S. Cl. 331—111 **7 Claims**

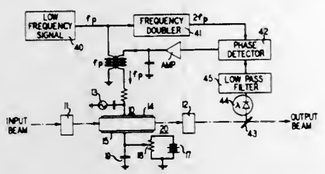


A unijunction transistor, a switch such as the emitter-to-collector path of a bipolar transistor, connected with the emitter-to-base path of the unijunction transistor, and a charged capacitor connected across the series circuit. When the switch is closed, the capacitor instantaneously discharges through the emitter-to-base diode of the unijunction transistor. Thus, the leading edge of this discharge wave is substantially coincident in time with the closing of the switch, that is, with the turn-on pulse employed to drive the bipolar transistor into conduction.

3,579,145
MODULATOR STABILIZATION CIRCUITS
Owen E. De Lange, Rumson, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Mar. 21, 1969, Ser. No. 809,261
Int. Cl. H01s *3/10;* **H03c** *1/06*
U.S. Cl. 332—7.51 **3 Claims**

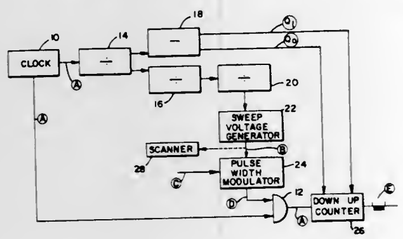
The operating point of a modulator is stabilized by superimposing a pilot signal upon the information bearing

modulating signal. The resulting modulation produced by the pilot signal is compared with a reference signal in a phase detector and a control signal generated which is used to counteract any drift of the operating point. Alternatively, the



average intensity of the modulator output signal is detected and used to alter the net bias applied to the modulator as a means of stabilization.

3,579,146
DIGITAL MODULATOR AND DEMODULATOR
Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Murray F. Cohen, Roslyn Heights, N.Y.
Filed Dec. 31, 1969, Ser. No. 889,478
Int. Cl. H03k *7/08, 9/08*
U.S. Cl. 332—9R **10 Claims**



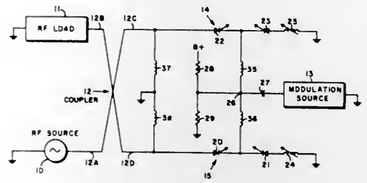
The modulation index of a pulse width modulated input signal is determined by employing the input signal, as synchronized with a reference signal, to control a gate which passes high frequency pulses to an up-down counter. The direction of counting of the counter is varied at twice the frequency of the input pulse repetition rate and the signal which controls counting direction is shifted in phase with respect to the reference signal whereby the output of the counter will be a positive or negative count having a magnitude commensurate with the degree of pulse width modulation of the input signal.

ERRATUM

For Class 332—19 see:
Patent No. 3,579,150

3,579,147
PHASE MODULATOR
Kenneth H. Brown, Phoenix, and Robert C. Fitting, Scottsdale, Ariz., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Jan. 8, 1969, Ser. No. 789,903
Int. Cl. H03c *3/12*
U.S. Cl. 332—29 **4 Claims**

A pair of tuned lines are coupled to a carrier signal source and a load through a quarter-wave coupler. The electrical length of the lines are electrically altered to phase modulate the carrier supplied by the source through the coupler to the load. Varactor diodes and a variable inductance in each of the lines vary the line electrical lengths such that there is a linear modulation of the carrier. The arrangement is such that the energy reflected from the two lines have phases opposing at the source such that there is no power supplied at the input coupler port while all of the reflected power from



the two lines is supplied in phase through the coupler output port to the load.

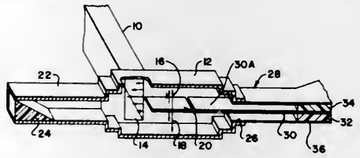
ERRATUM

For Class 332—302 see:
Patent No. 3,579,281

3,579,148
GRID DIRECTIONAL COUPLER FOR OVERSIZE CIRCULAR WAVEGUIDES
Alan E. Blume, Scotia, N.Y., assignor to General Electric Company
Filed Apr. 10, 1969, Ser. No. 814,993
Int. Cl. H01p *5/14, 1/00*
U.S. Cl. 333—10 **18 Claims**

A directional coupler, for use in the propagation of microwave frequency electromagnetic energy, comprises a septum connected diagonally across a right angle junction of two circular waveguides. The septum is a metallic grid comprised of a plurality of substantially parallel electrical conductor of diameter much smaller than the wavelength of the propagated frequency, and the spacing between adjacent parallel conductors is also smaller than the propagation wavelength. The plurality of conductors may form a grid of equal size squares or a series of nested ellipses, and provide uniform complex reflection and transmission coefficients over the entire septum.

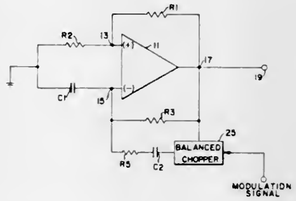
3,579,149
WAVEGUIDE TO STRIPLINE TRANSITION MEANS
Kurt G. Ramsey, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Dec. 8, 1969, Ser. No. 883,014
Int. Cl. H01p *5/12, 1/16*
U.S. Cl. 333—11 **5 Claims**



Described is apparatus for translating electromagnetic wave energy traveling in the TE_{10} mode in a rectangular

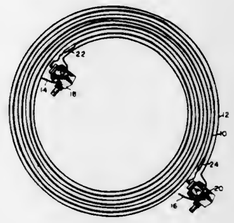
waveguide to the TEM mode in a stripline transmission line or vice versa. This is accomplished by means of an E-plane folded tee connection having an input port connected to a waveguide and a stripline transmission line connected to a double output port of the folded tee.

3,579,150
VOLTAGE CONTROLLED OSCILLATOR
Rosario S. Badessa, Dedham, Mass., assignor to Damon Engineering, Inc., Needham Heights, Mass.
Filed Oct. 3, 1969, Ser. No. 863,589
Int. Cl. H03c *3/08;* **H03b** *5/20;* **H03f** *1/34*
U.S. Cl. 332—19 **10 Claims**



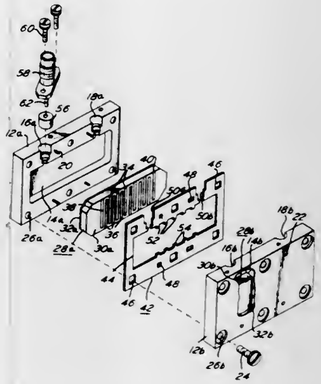
The oscillator disclosed herein employs a high gain differential amplifier of a type having a relatively low offset voltage between the input terminals. A positive feedback signal is applied to the noninverting input terminal of the amplifier and a delayed negative feedback signal is applied to the inverting input terminal, the delay being provided by a capacitor connected to the inverting terminal. This combination of feedback components causes the amplifier to oscillate at a frequency which is a function of the delay provided by the capacitor. The effective delay is then varied by means of an AC signal which is applied to the capacitor in synchronism with the amplifier output signal. The AC signal is obtained by means of a chopper which is synchronized or driven by the amplifier and which operates on a control or modulation signal provided to the oscillator. The amplitude of the AC signal applied to the capacitor will thus be proportional to the amplitude of the modulation signal. Accordingly, the frequency of oscillation is variable as a function of the modulation signal amplitude.

3,579,151
ACOUSTIC AND ELECTROMAGNETIC SHIELD AND MECHANICAL SUPPORT FOR ULTRASONIC STRIP DELAY LINE
David J. Whitney, Amherst, and Raymond R. Nepveu, Londonderry, N.H., assignors to Sanders Associates, Inc., Nashua, N.H.
Filed Oct. 20, 1969, Ser. No. 867,755
Int. Cl. H03h *9/30*
U.S. Cl. 333—30 **6 Claims**



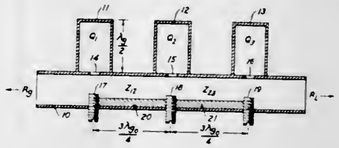
An ultrasonic strip delay line having its longitudinal edges covered with acoustic absorbing tape is coiled with a dummy shielding strip and placed between clamping plates. The dummy strip provides a mechanical stop which prevents distortion of the delay line as well as a grounded metal enclosure for electromagnetic and acoustic shielding of the delay line.

3,579,152
INTERDIGITAL STRIPLINE FILTER MEANS WITH THIN SHORTING SHIM
Michael Moore, Philadelphia, Pa., assignor to American Electronic Laboratories, Inc., Colmar, Pa.
Filed Sept. 5, 1968, Ser. No. 757,529
Int. Cl. H01p *3/08, 11/00;* **H03h** *13/00*
U.S. Cl. 333—73 **10 Claims**



A stripline interdigital filter means in which the stripline ground planes are metal layers on the outer surfaces of a pair of mating sheets of an insulating material, the resonator strips and coupling strips of the filter are a printed circuit on the mating surfaces of one of the insulating sheets, and the shorting member of the filter is a thin metal shim having shorting tabs extending between the mating surfaces of the insulating sheets and clamped against the resonator strips.

3,579,153
MICROWAVE FILTER
Han-Chiu Wang, Salem, N.H., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Sept. 7, 1967, Ser. No. 666,013
Int. Cl. H03h *7/10*
U.S. Cl. 333—73 **6 Claims**

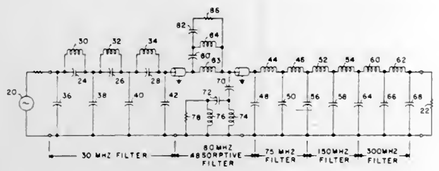


A microwave bandstop filter of the type in which a plurality of resonant cavities are coupled by irises at intervals to a connecting waveguide. According to the invention the intervals are made three-quarters wavelength and the connecting guide section between each pair of irises is provided with a particularly chosen characteristic impedance which eliminates undesirable responses of the connecting sections without introducing further discontinuities to the structure.

3,579,154
VHF FILTER HAVING ABSORPTIVE TUNED SECTION TO ELIMINATE NARROW SPURIOUS PASSBAND
Glen W. Deen, Richardson, Tex., assignor to Collins Radio Company, Dallas, Tex.
Filed Apr. 23, 1969, Ser. No. 818,590
Int. Cl. H03h *7/08*
U.S. Cl. 333—76 **11 Claims**

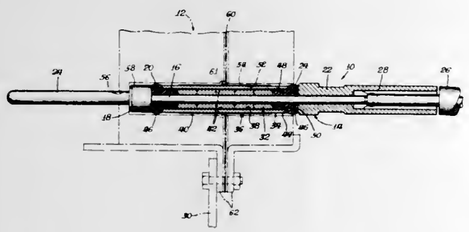
Disclosed is a very high frequency filter for use with a high frequency radio transmitter which prevents transmission of

harmonics. The filter includes an absorptive filter which eliminates spurious passbands resulting from interaction of



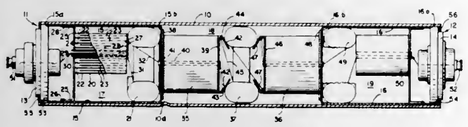
components. The absorptive filter includes highpass filters arranged in an L-network.

3,579,155
FILTERED CONNECTOR PIN CONTACT
Jeff Tuchto, Don Mills, Ontario, Canada, assignor to The Bunker-Ramo Corporation, Broadview, Ill.
Filed Feb. 1, 1967, Ser. No. 613,346
Int. Cl. H03h *7/04*
U.S. Cl. 333—79 **4 Claims**



Pin contact for filtered connector, having central metal element surrounded by a ferrite ferrule and an outer ceramic sleeve, and including flexible conductive washers end-loading the ferrule and sleeve, to provide flexibility, and prevent breaking.

3,579,156
SHIELDED FILTER
Peter Parfitt, Hove, England, assignor to Worcester Controls Corporation, West Boylston, Mass.
Filed Aug. 15, 1968, Ser. No. 752,913
Int. Cl. H03h *7/04*
U.S. Cl. 333—79 **10 Claims**

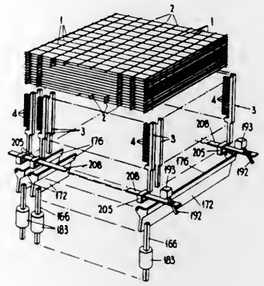


An electrical filter comprises an elongated metallic tube having a pair of open-ended cans inserted into the tube ends with the open ends of the cans being joined to the tube adjacent the tube ends. The interior regions of the tube, divided by the closed ends of the cans, contain inductance and capacitance elements electrically interconnected to one another, said interconnections including conductive tabs carried by the capacitance elements. The ends of the tube are hermetically sealed; and the interior of the tube is filled with a potting compound.

ERRATUM

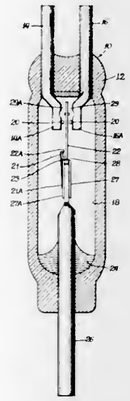
For Class 333—97 see:
Patent No. 3,579,282

3,579,157
ELECTRIC CROSSBAR SWITCHES
Donald Edward Rowley, Coventry, England, assignor to The General Electric and English Electric Companies Limited, London, England
Filed Nov. 7, 1969, Ser. No. 874,791
Claims priority, application Great Britain, Nov. 8, 1968, 53060/68
Int. Cl. H01h *67/14*
U.S. Cl. 335—112 **6 Claims**



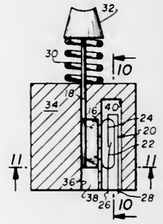
A crossbar switch in which an array of contact sets is formed by a cross-wire matrix. The contact sets are operated by movement of respective 'interposer members' into the plane of the array. The interposer members are operated selectively by coordinate crossbar systems one of which moves a row of interposer members into driving positions underneath the respective contact sets and the other of which, crossing the first, drives the selected one of the positioned interposer members into operative engagement with the selected contact set. The interposer members are carried by, and magnetically located on, the bars of the first coordinate system so that operation of a bar of the first system does not disturb a previous connection made by the same bar, the magnetic coupling accommodating the relative movement of the interposer members.

3,579,158
ARMATURE STRUCTURE FOR REED SWITCHES
John Kutyla, Chicago, Ill., assignor to C. P. Clare & Company, Chicago, Ill.
Filed July 28, 1969, Ser. No. 845,202
Int. Cl. H01h *51/28*
U.S. Cl. 335—151 **21 Claims**



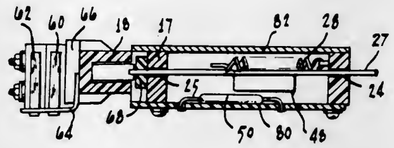
A sealed switch with an elongated glass housing having pole pieces sealed in both ends includes a uniplanar, rigid armature having a projecting or transversely extending end portion. A flat spring movably mounts said one end on one pole piece with the projection forming a working gap with this pole piece so that the armature has two working gaps and the switch has increased sensitivity. In one switch, a pair of pole pieces are sealed at one end of the housing with the free end of the armature disposed between the pair of pole pieces. In another switch, a single pole piece is provided at each end.

3,579,159
PUSHBUTTON MAGNETIC REED SWITCH
William T. Posey, 608 Knoll Road, Boonton, N.J.
Filed May 3, 1968, Ser. No. 726,391
Int. Cl. H05b *51/28*
U.S. Cl. 335—205 **7 Claims**



A novel reed switch assembly provided with a ceramic bar magnet as the switch actuating means is disclosed. The structure of the novel reed switch is characterized by the arrangement of the ceramic bar magnet with an iron backing plate.

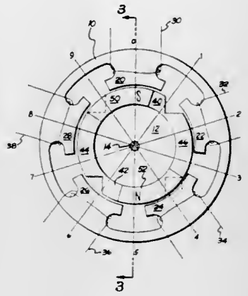
3,579,160
PUSHBUTTON MECHANISM
Harold Jessup Mackway, Haddon Heights, N.J., assignor to RCA Corporation
Division of Ser. No. 707,800, Feb. 23, 1968, Pat. No. 3,519,766. This application June 2, 1969, Ser. No. 829,530
Int. Cl. H01h *13/12, 13/52*
U.S. Cl. 335—206 **5 Claims**



Pushbutton switches of the type in which, in each bank, the depression of one button releases a previously depressed button. A printed circuit board leading to the electrical contacts of one bank of switches acts also as a sidewall for that bank of switches, and an electric and magnetic field shield member serves as its other sidewall. Additional features of these switches include simple and inexpensive one-piece plungers, simple means for automatically illuminating the depressed buttons, means for automatically electrically indicating whether a pushbutton in a bank is depressed, and means for resetting, in unison, a plurality of banks of switches.

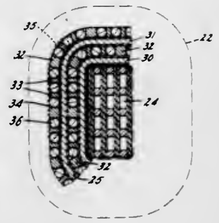
3,579,161
ELECTROMAGNETIC DEVICE
Sigmunt J. Kremzner, Pompton Plains, and William Pasechnick, Little Ferry, N.J., assignors to Singer-General Precision, Inc., Little Falls, N.J.
Filed Oct. 17, 1969, Ser. No. 867,148
Int. Cl. H01f *7/08*
U.S. Cl. 335—272 **2 Claims**

An electromagnetic device in which a rotor rotates within a stator in response to a plurality of electromagnets formed on the stator being selectively magnetized to cause attraction and repulsion with a north pole portion and a south pole portion of the rotor. Two or more spaced permeable bars are



carried by the rotor, and are adapted to provide a variable reluctance path for magnetic flux passing between the rotor and the stator.

3,579,162
WINDING DUCT CONSTRUCTION FOR POWER TRANSFORMER
Sudhir D. Savkar, Scotia, N.Y., assignor to General Electric Company
Filed Nov. 28, 1969, Ser. No. 880,619
Int. Cl. H01f *27/10*
U.S. Cl. 336—57 **8 Claims**

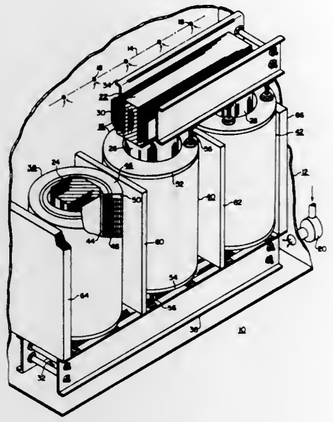


The ducts between adjacent layers of windings are formed into a plurality of longitudinal passageways of generally square cross section. A flat strip of insulating material twisted about the central longitudinal axis thereof is provided in each of the passageways to augment the heat flow from the winding to the coolant flowing in the passageway.

3,579,163
LIQUID-FILLED TRANSFORMER WITH FOAMED INSULATION
John C. Cronin, Horsham, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Sept. 24, 1969, Ser. No. 860,688
Int. Cl. H01f *27/02*
U.S. Cl. 336—94 **6 Claims**

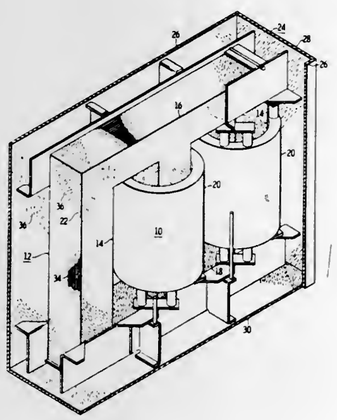
Electrical inductive apparatus of the type containing a magnetic core-winding assembly immersed in a liquid-insulating material. The breakdown voltage of predetermined insulating gaps in the apparatus is increased, while maintaining substantially the same dielectric constant across the gap as that of the liquid-insulating material, by disposing an open

cell-insulating foam material in the predetermined gaps. The open cells of the foam material are impregnated or filled with



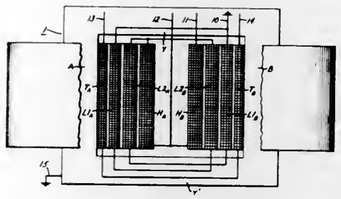
the liquid-insulating material, which increases the breakdown voltage in volts per mil across the gap.

3,579,164
NOISE REDUCTION SYSTEMS FOR ELECTRICAL TRANSFORMERS
James L. Rotruck, Sharon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Nov. 14, 1969, Ser. No. 876,768
Int. Cl. H01f15/00
U.S. Cl. 336—100 **8 Claims**



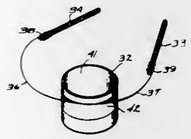
A system for reducing noise generated in an electrical transformer due to changing of size and shape of the ferromagnetic core when excited with alternating electric current. The noise reduction system comprises attaching flexible fibers to parts of the ferromagnetic core and parts of the housing or casing of the transformer. The flexible fibers absorb energy from the air column set up by the core when it changes size and shape and reduces the effectiveness of the air column in setting up objectional audible noise.

3,579,165
WINDING CONNECTION FOR SINGLE PHASE TWO LEG ELECTRIC TRANSFORMER
Wallace M. Johnson, Pittsfield, Mass., assignor to General Electric Company
Filed Sept. 24, 1969, Ser. No. 860,757
Int. Cl. H01f *27/28*
U.S. Cl. 336—170 **5 Claims**



A single phase power transformer having a low power tertiary winding comprises a two-legged core with four concentric coils on each leg. The radially innermost coils are of unequal turns and series connected to constitute the tertiary winding. The high voltage main winding comprises the two radially outermost coils of like formation connected in parallel. The low voltage main winding comprises two series coil circuits in parallel, each series circuit including a radially inner intermediate coil on one leg and a radially outer intermediate coil on the other leg, the radially intermediate coils on each leg having unequal numbers of turns.

3,579,166
ELECTRICAL COIL
Roderick V. Sawyer, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.
Filed Oct. 8, 1968, Ser. No. 765,791
Int. Cl. H01j *15/10*
U.S. Cl. 336—192 **5 Claims**

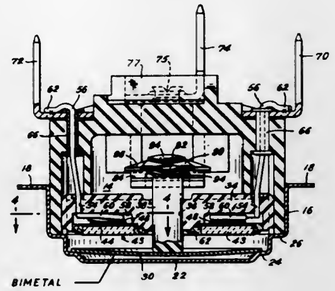


Strands of material along selected segments of an indeterminate length of stranded conductive material are welded together and severed to provide predetermined lengths of stranded conductive material having the strands at the ends thereof secured together to prevent unraveling. Such pieces of conductive material are secured to one or more coil lead wires to form a pair of terminal leads in a coil assembly. Each strand comprises a pliant fiber core about which is wrapped a conductive foil.

3,579,167
THERMOSTATIC SWITCH WITH IMPROVED HEATER ASSEMBLY AND METHOD OF ASSEMBLING SAME
Jack W. Grable, Lexington, Ky., assignor to Texas Instruments Incorporated, Dallas, Tex.
Continuation of application Ser. No. 566,674, July 20, 1966, now abandoned. This application Nov. 21, 1969, Ser. No. 872,446
Int. Cl. H01h *37/54, 37/64, 61/013*
U.S. Cl. 337—102 **4 Claims**

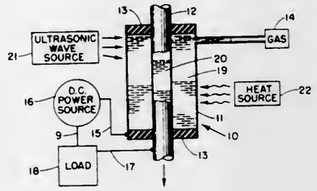
A thermostatically controlled electrical switch having a heater assembly adjacent the thermostatic element. The heater assembly includes ceramic substrate with a resistive coating on the face of the substrate remote from the thermostatic element. First and second spaced conductive contact

layers are provided on the resistive coatings. The resistive coatings are connected to exterior terminals via stiff spring



elements which have coiled end portions biased into firm electrical contact with the respective contact layers.

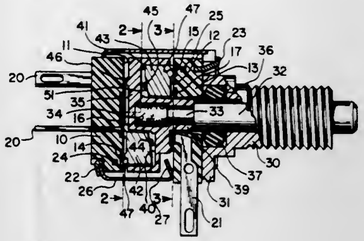
3,579,168
CYCLIC SWITCH
Alex Vary, North Olmsted, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Dec. 31, 1969, Ser. No. 889,387
Int. Cl. H01h *37/36, 87/00*
U.S. Cl. 337—114 **13 Claims**



A switch utilizing a liquid metal in the cavity of a metal chamber connected in a conductor through which current flows from a DC source to a load or vice versa. Abrupt, cyclic decreases in current are effected by the formation of vapor films or vapor cavities which form at the interfaces between the liquid metal and the walls of the chamber due to ohmic heating. A source of pressurized gas communicates with the interior of the chamber. Cooling means for the chamber are provided to extract heat at a predetermined rate. The chamber may also be subjected to ultrasonic waves and heat waves to alter the wetting-dewetting action of the liquid metal.

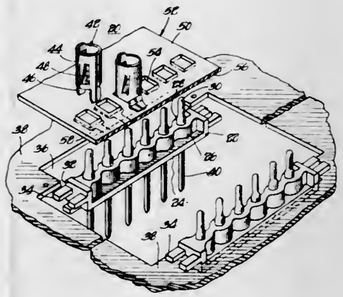
3,579,169
A VARIABLE RESISTOR FOR DUAL OPERATION
Clarence R. Dickinson, Greendale, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.
Filed Feb. 5, 1969, Ser. No. 796,686
Int. Cl. H01c *9/02*
U.S. Cl. 338—170 **7 Claims**

A variable resistor providing an integral assembly for dual operation comprising a pair of arcuate resistance track elements in axially spaced, face-to-face relationship and having interposed therebetween a single insulating rotor or brush carrier including oppositely facing cavities, each cavity being recessed relative to a central plane and adapted to individually receive conducting brush members. Biasing springs are provided for maintaining the brush members in electrical



contact with the respective resistance elements, as well as individual terminal assemblies for each of the resistance elements.

3,579,170
MODULAR ELECTRICAL CONNECTOR ASSEMBLY
Bruno Baumanis, River Forest, and Robert W. Sebastian, Villa Park, Ill., assignors to Molex Incorporated, Downers Grove, Ill.
Filed May 20, 1968, Ser. No. 730,350
Int. Cl. H05k *1/00*
U.S. Cl. 339—17 **6 Claims**

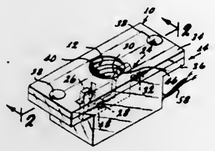


A modular electrical connector assembly for making connections to printed circuit boards comprising a plurality of male and female terminals. Each of the female terminals includes a circular cylindrically shaped barrel portion having a plurality of resilient contact members integrally formed from the wall thereof and facing inwardly toward the center thereof, and a pair of tab members for insertion into an aperture in a printed circuit board wherein they are bent to secure the terminal thereon. The male terminals each includes at least one circular cylindrical contact end for insertion into either open end of the barrel portion of a female terminal. The male terminals may be used separately or mounted in spaced relation in an insulating terminal block, and may also have a solderless wrap or other type of connector end for making external connection thereto.

3,579,171
SAFETY SOCKET
Arthur S. Woodward, Sylmar, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Sept. 25, 1969, Ser. No. 860,973
Int. Cl. H01r *13/44, 33/08, 33/54*
U.S. Cl. 339—34 **10 Claims**

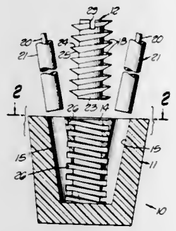
A socket for an ordinary incandescent lamp which prevents electrical shock if a child sticks his finger into it, comprising an aperture for receiving the base of a lamp and a shuttle which carries an operating arm and a pair of electrical

contacts. The shuttle is spring biased to a position wherein the arm lies within the aperture while the contacts are spaced from the aperture. However, when a lamp is screwed into the



aperture, it pushes the operating arm and shifts the shuttle so that the electrical contacts move to the aperture to contact the base of the lamp.

3,579,172
SOLDERLESS CONNECTOR ASSEMBLY
Marvin A. Clark, 7902 Woodley Ave., Van Nuys, Calif.
Filed June 23, 1969, Ser. No. 835,443
Int. Cl. H01r *9/08, 7/08*
U.S. Cl. 339—97 **15 Claims**

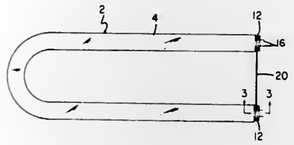


A solderless connector having a main body of insulation formed with at least one pair of wells in side-by-side relation including a threaded well for a deeply threaded conductive member and a nonthreaded well snugly receiving a sheathed conductor with one side of the conductor positioned to intersect and traverse the thread crests of the threaded conductor. The threaded conductor may be shorter than the threaded well or it may have a protruding outer end usable as a terminal lug or as the male end of a service cord plug.

3,579,173
UNDERGROUND CABLE TAP CONNECTOR
Richard G. Greener, Poughkeepsie, N.Y., assignor to Fargo Mfg. Company, Inc., Poughkeepsie, N.Y.
Filed Dec. 23, 1969, Ser. No. 887,652
Int. Cl. H01r *7/04*
U.S. Cl. 339—97R **7 Claims**

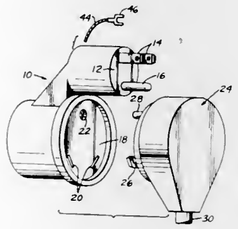
A tap for connecting a line to a cable in an underground application without removing the insulation from the cable and which will provide a moistureproof seal at the point of connection of the tap to the cable.

3,579,174
LAMP-BASE ASSEMBLY
Marcellus N. Gilbert, Jr., Lynnfield, Mass., assignor to Sylvania Electric Products, Inc.
Filed June 24, 1968, Ser. No. 739,438
Int. Cl. H01r *13/60*
U.S. Cl. 339—144 **4 Claims**



A lamp-base assembly for a tubular lamp bent into a U-shaped configuration in which the bases on the ends of the lamp are connected to one another by a rod.

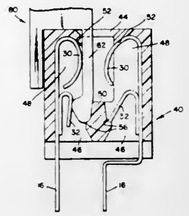
3,579,175
ELECTRIC CIRCUIT ADAPTER MEMBER
Larry L. Shroyer, Kendallville, Ind., assignor to Lyall Electric, Inc., Albion, Ind.
Filed Aug. 13, 1969, Ser. No. 849,645
Int. Cl. H01r *13/50*
U.S. Cl. 339—156 **5 Claims**



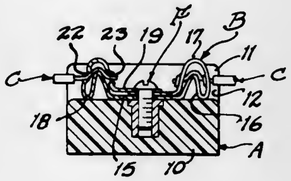
The invention relates to an adapter member having a body of electrical insulating material with elements of a male fitting projecting therefrom to permit the adapter to be plugged into a receptacle. The body has elements of a female fitting therein adapted for receiving the male fitting on the end of an electric cable. The female fitting portion of the body may receive a larger male plug than can be received in the receptacle, or a male plug of a different character than can be received in the receptacle. The male fitting portion and female fitting portion of the adapter preferably have their axes parallel and offset so that the female fitting portion can be disposed below the male fitting portion and thereby reduce the load on the receptacle.

3,579,176
MICROMINIATURE PRINTED CIRCUIT CONNECTOR
Michael Bokor, Huntington Beach, and Norbert L. Moulin, Placentia, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Mar. 3, 1969, Ser. No. 803,896
Int. Cl. H01r *13/64, 13/24*
U.S. Cl. 339—176 **3 Claims**

A connector comprising a connector block with contact elements mounted therein for contacting the leads of a printed-circuit card. The contact elements have tabs for positioning and locking the contact elements in the connector block. The connector block includes an aperture for receiving a printed-circuit card and apertures for receiving the contact elements.



3,579,177
TERMINAL BOARD ELECTRICAL CONNECTOR
Robert E. Lawlor, Costa Mesa, Calif., assignor to Electro-Clamp Corporation, Beverly Hills, Calif.
Continuation-in-part of application Ser. No. 702,411, Feb. 1, 1968, now Patent No. 3,477,060. This application Aug. 21, 1969, Ser. No. 852,060
Int. Cl. H01r *7/06*
U.S. Cl. 339—198 **2 Claims**

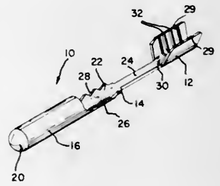


A plurality of connectors, mounted in transverse slots in a terminal board, provide connections between respective pairs of axially aligned conductor wires. Each connector is of resilient sheet metal, including a central web secured to the terminal board by a fastener, and spring jaws at each end, each having means for clamping a respective wire end.

ERRATUM

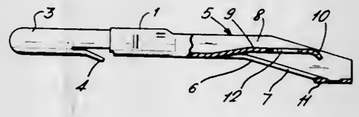
For Class 339—217 see:
Patent No. 3,579,283

3,579,178
ELECTRICAL TERMINAL AND HOUSING THEREFORE
Allen Edwin Travis, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Dec. 4, 1969, Ser. No. 882,069
Int. Cl. H01r *9/08*
U.S. Cl. 339—221 **3 Claims**



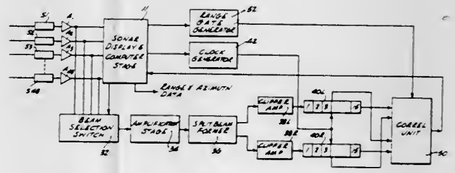
The disclosure relates to terminals for terminating the lead ends of a coil winding and includes provisions for securing the terminals within apertures located in flanges integral with a coil bobbin with a portion of the terminals extending from the flange for plugging into mating receptacles.

3,579,179
FUSE CONNECTORS
Daniel Dumeige, Pontoise, France, assignor to AMP de France, Pontoise, France
Filed Sept. 23, 1968, Ser. No. 761,473
Claims priority, application France, Sept. 27, 1967, 122,483
Int. Cl. H01r *11/22;* **H01h** *85/22*
U.S. Cl. 339—258 **5 Claims**



A fuse connector has a fuse contact formed from sheet metal with a body having an apertured extension, a resilient tongue in the aperture engaging an end of a fuse cartridge, side portions along the aperture embracing sides of the cartridge, and a bar joining the side portions serves to limit deflection of the tongue. A housing houses the fuse connectors to provide a connector assembly and it has hinged cover means for access to the fuse; commoning strips may be employed to connect the fuse connectors with other selected connectors of the connector assembly.

3,579,180
BEAM INTERPOLATING SYSTEM
Fausto V. Taddeo, Anaheim, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Aug. 6, 1965, Ser. No. 477,682
Int. Cl. G01s *9/66*
U.S. Cl. 340—3 **14 Claims**

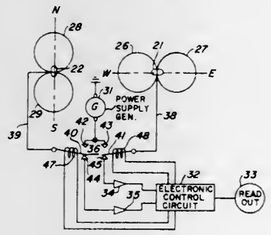


CLAIM 1. In a sonar receiving system including means for effectively forming a plurality of receiving beams, each beam representable by a composite signal comprising signals received from another azimuth range the effective centerline of each beam having an azimuth in the center of said azimuth range, said sonar receiving system further including processing and computing means for processing each composite signal to detect the range of a target having an azimuth within the azimuth range of one of said beams, an improved system for interpolating the composite signal in which a target has been detected to resolve the azimuth of the target with respect to the azimuth of the centerline of said beam comprising: means for splitting a composite signal representative of a receiving beam in which a target has been detected into a pair of signals representative of a pair of beams which are parallel to said centerline and equidistantly disposed with respect thereto; a pair of multibit delay lines, coupled to receive said pair of signals;

a plurality of analog storing units, each unit, corresponding to a different azimuth deviation with respect to the azimuth of said centerline, being coupled to two bits of said pair of delay lines; means for integrating in each of said storing units analog signals as a function of the phase correlation of signals

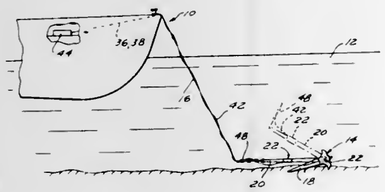
in two different bits of said pair of delay means, the two bits having signals exhibiting a maximum phase correlation being related to the azimuth deviation of said target from the azimuth of said centerline; means for scanning said plurality of storing units to detect the unit coupled to the two bits having signals which exhibit a maximum of phase correlation; and means for providing as a function of the detected unit an output signal which indicates the azimuth deviation of the target from the azimuth of said centerline.

3,579,181
SONAR RANGING SYSTEM FOR LOCATING SUBMERGED OBJECTS
Frank Massa, Cohasset, Mass., assignor to Massa Division Dynamics Corporation of America, Hingham, Mass.
Filed May 14, 1969, Ser. No. 824,407
Int. Cl. G01s *9/66*
U.S. Cl. 340—3-R **9 Claims**



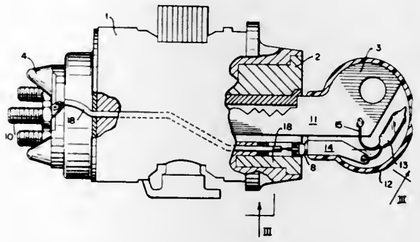
A pair of narrow-beam directional transducers are mechanically joined together to radiate sonic energy in angular directions which are fixed with respect to each other. Electrical switching means cause the individual transducers to sequentially radiate bursts of sonic energy. Each of the transducers picks up the reflected sonic energy, and electronic means ascertains the azimuth of the object reflecting the energy, responsive to the relative strength of the signals picked up by the two transducers.

3,579,182
ANCHOR DRAGGING ALARM CONTROL BASED ON ANCHOR INCLINATION
Leonard Schneider, Beaver Brook Road, Lyme, Conn.
Filed Mar. 19, 1969, Ser. No. 808,487
Int. Cl. G08g *3/00*
U.S. Cl. 340—29 **9 Claims**



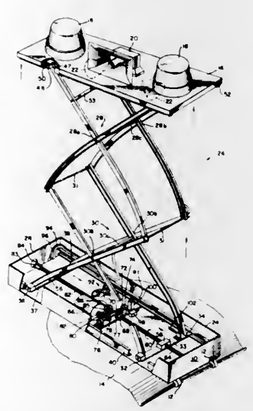
An inclination-sensitive switch is operatively secured to a part of an anchor. The switch is open when the part is oriented such that the anchor grabs the bottom. When the orientation of the anchor part exceeds the horizontal by a predetermined value, corresponding to that orientation when the anchor is freed from the bottom, that switch is closed to actuate an alarm.

3,579,183
SIGNALLING DEVICE TO PREVENT LEAVING A KEY IN A LOCK
Paul Lipschutz, Croissy sur Seine (Yvelines), France, assignor to Societe d'Exploitation des Brevets Neiman S. A., Neuilly-Seine, France
Filed July 25, 1968, Ser. No. 747,670
Claims priority, application France, Oct. 6, 1967, 123,557
Int. Cl. B60q *1/26*
U.S. Cl. 340—52 **8 Claims**



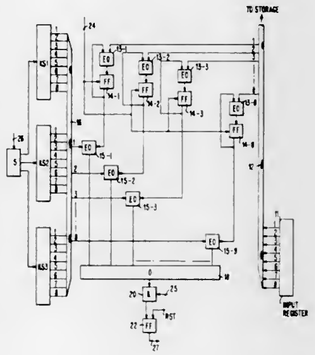
A signalling device to prevent leaving a key in a lock. The device includes a lock which has a number of different positions and a key coacting with the lock to displace it between these positions. An electromechanical means coacts with the key and lock to give a warning signal when the key places the lock in at least one of its positions, such as the position which the lock has when the key is introduced into and removed from the lock. The device is particularly suited for use in connection with ignition switches of vehicles, and the signal which is provided can either be visible, audible, or vibratory so as to be felt by the fingers of the operator.

3,579,184
PORTABLE EXTENDABLE SIGNAL LIGHT PLATFORM
Robert J. Forestal, Indianapolis, Ind., assignor to Dura Corporation, Southfield, Mich.
Filed Apr. 11, 1969, Ser. No. 815,301
Int. Cl. G08b *5/36, 3/00*
U.S. Cl. 340—137 **12 Claims**



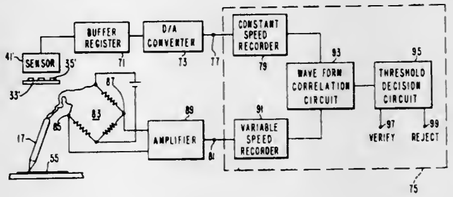
A platform for carrying emergency signals having a lazy-tong structure attached to its underside. Said structure is actuable by an electric motor to raise and lower the platform to and from an extended position. The platform serves as a cover for a cabinet which houses the motor and the retracted lazy-tong structure, said cabinet being mountable on the roof of an emergency vehicle.

3,579,185
METHOD AND APPARATUS FOR CHECKING A DATA TRANSFER OPERATION
Wilhelm Spruth, Sindelfingen, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Sept. 20, 1968, Ser. No. 761,186
Claims priority, application Germany, Sept. 27, 1967, P1549484.5
Int. Cl. H04l *1/10*
U.S. Cl. 340—146.1 **12 Claims**



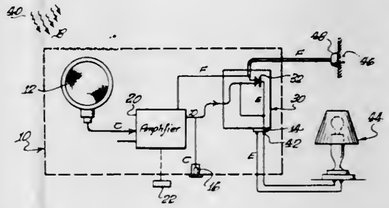
The accuracy of a data transfer operation, particularly one which involves loading a micro program into an alterable control storage device for use in a data processing system, is verified by deriving a check number from the transferred data and comparing the desired check number with a predetermined check number known to be correct. A variety of concepts may be used to obtain the derived check number such as successive logical Exclusive OR operations on transferred blocks of data or selected portions of the blocks.

3,579,186
PERSONAL IDENTIFICATION METHOD AND APPARATUS
Robert R. Johnson, Franklin, and Richard L. Dunham, Bloomfield Hills, Mich., assignors to Burroughs Corporation, Detroit, Mich.
Filed June 25, 1968, Ser. No. 739,803
Int. Cl. G06k *5/00*
U.S. Cl. 340—146.3 **18 Claims**



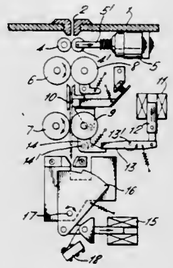
A method and apparatus for positively determining whether an individual is a member of a predetermined group based on unique repeatable characteristics of an electrical waveform generated by a force-responsive transducer whenever the person writes his name or other mark. In accordance with the preferred embodiment of the invention disclosed herein, positive identification of a person as being an authorized member of a predetermined group is made by an apparatus which compares prerecorded authorized signature characterizing information with an electrical waveform generated when the person signs his signature. The comparison may for example comprise a cross or autocorrelation technique in which the identifying apparatus determines whether the waveform generated by the person in signing his signature correlates within a predetermined degree with the previously recorded signature identifying information.

3,579,187
MUSIC RESPONSIVE LIGHT POWER CURRENT SWITCHING DEVICE
Robert L. Knott, 10406 Leolang Ave., Sunland, Calif., and Donald H. Hadel, 7424 Forbes Ave., Van Nuys, Calif.
Filed Sept. 26, 1967, Ser. No. 670,599
Int. Cl. G08b *5/22*
U.S. Cl. 340—148 **10 Claims**



A music responsive light switching device comprising a music signal pickup which is connected to a control means which regulates the output of a power signal. The regulated power signal is applied to an electrical socket receptacle into which a conventional lamp is electrically plugged. The lamp can then be turned on and off in accordance with the characteristic rhythm of the music.

3,579,188
AUTOMATIC TICKET GATE
Keisuke Osaki, Kyoto, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan
Filed Feb. 5, 1968, Ser. No. 703,074
Claims priority, application Japan, Feb. 6, 1967, 42-7532
Int. Cl. G07f *7/00*
U.S. Cl. 340—149 **12 Claims**

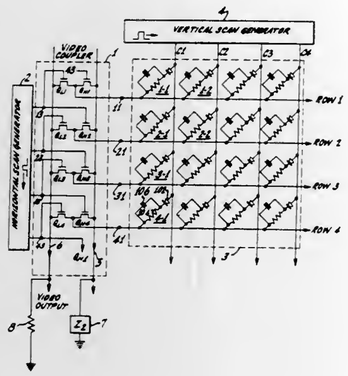


This invention comprises an automatic ticket gate which permits a passenger to pass therethrough only when the ticket he inserted into the slot of the gate for examination of its validity has been recognized as valid. A passenger is prevented from passing through until the ticket is removed from the slot in the gate, even when the ticket is recognized as valid.

3,579,189
COUPLING AND DRIVING CIRCUIT FOR MATRIX ARRAY
Paul K. Weimer, Princeton, N.J., assignor to RCA Corporation
Filed Dec. 13, 1968, Ser. No. 783,591
Int. Cl. H04q *3/00*
U.S. Cl. 340—166 **7 Claims**

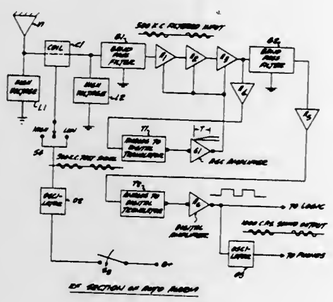
A coupling circuit comprising N stages connected in parallel between two conductors. Each stage comprises the con-

duction paths, in series, of two field effect transistors and an output terminal at the connection of the two paths. The output terminals are connected to the respective rows of an array of light sensing circuits. One transistor of one stage is turned on to connect one row of circuits through one con-



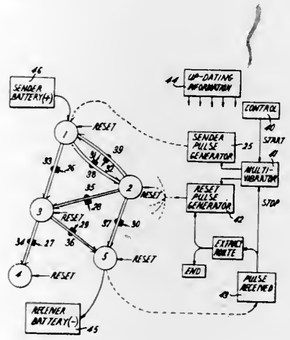
ductor to an output circuit to permit the circuits of that row to be read out, in sequence. Concurrently, the other transistor of the following stage is turned on to connect the following row of circuits through the second conductor to ground to permit the circuits of the following row to be precharged. The process is continued until all rows of the matrix are successively precharged and read out.

3,579,190
AUTOMATIC ALARM DETECTOR
Ernest C. Karras, Chicago, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed May 5, 1967, Ser. No. 636,446
Int. Cl. H04q *9/00*
U.S. Cl. 340—167 **4 Claims**



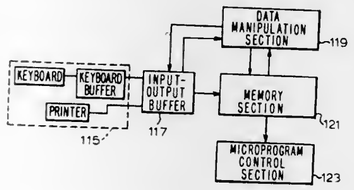
A system is provided for unattended monitoring of international distress signals. The system employs an RF section which responds to all the signals in the frequency range of interest. The RF signals are fed through two analog-to-digital translators; one of which supplies a control signal to automatic gain control equipment to control amplification in the RF section and the other of which supplies DC pulses according to the intelligence in the original RF signals. The DC pulses are employed by logic circuits which provide an output signal if (1) at least 4 consecutive pulses are present, (2) the pulses are of duration between 3.5 seconds and 6 seconds, and (3) the pulses are separated by time intervals of between 10 milliseconds and 1.5 seconds duration.

3,579,191
NETWORK USING ADAPTIVE ELEMENTS
John Hugh Andreae, Christchurch, New Zealand; Brian Ronald Gaines, Cambridge, and Peter White, Bishop's Stortford, England, assignors to International Standard Electric Corporation
Filed Oct. 27, 1967, Ser. No. 678,589
Claims priority, application Great Britain, Oct. 31, 1966, 48616/66
Int. Cl. G06f *15/18, 15/56*
U.S. Cl. 340—172.5 **10 Claims**



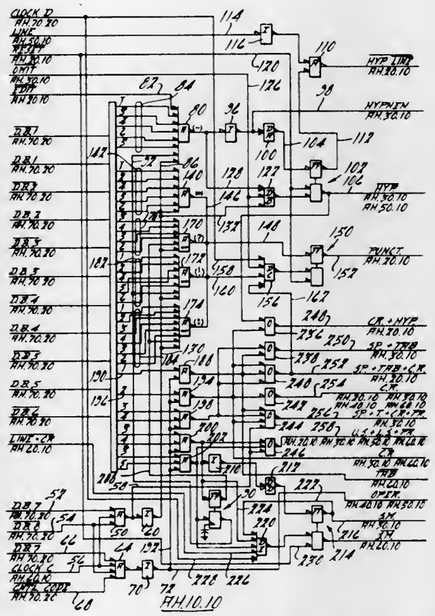
A communication network is provided using information storage control means for selecting a direct path from calling to called portions of the network. The network contains nodes and links therebetween. Each of the links has a switch controlled by an adaptive element therein. The adaptive element includes means for controlling the probability that a signal which emanates from the node traverses the link containing the adaptive element. Means operated in cooperation with the adaptive element are further provided so that any node which receives and passes on a signal is inhibited from receiving a further signal without first being reset.

3,579,192
DATA PROCESSING MACHINE
David Rasche, Bloomfield Hills, Mich.; Bernardo N. Levy, Livingston, N.J.; Bruce L. Ayres, Southfield; Hoy Ying Chang, Westland; Cornelius C. Perkins, and William W. Phillips, Birmingham, Mich., assignors to Burroughs Corporation, Detroit, Mich.
Filed Nov. 2, 1967, Ser. No. 680,184
Int. Cl. G06f *9/16*
U.S. Cl. 340—172.5 **23 Claims**



An improved digital computer having a limited number of hardware elements which can be used to perform varied logical processes on data under the control of macroinstructions, each macroinstruction being implemented through a series of stored microinstructions forming a stored microprogram, each microinstruction corresponding to a control signal for actuating a hardware element in the computer, a series of said microinstructions being used to implement the hardware elements in varied sequences in order to perform different logical processes.

3,579,193
EDITING AND REVISION SYSTEM
Donald R. Bernier, Lake Orion, Mich., assignor to Intercontinental Systems, Inc., Los Angeles, Calif.
Filed May 20, 1968, Ser. No. 730,477
Int. Cl. G06f *3/00*
U.S. Cl. 340—172.5 **46 Claims**

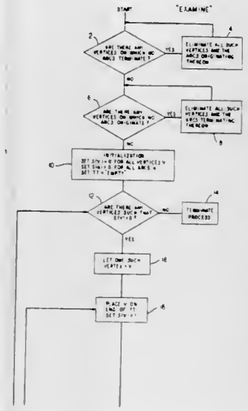


An electronic system for editing and controlling the format of information reproduced on a sheet of paper or other recording device from an automatic input system. The edit control system may be divided into two of the parts, the first of which is the edit control portion and the second is the margin control portion. The edit control portion enables the user to automatically stop the input device after a plurality of preselected information groups have been sensed, as for example a character, a word, a line, a sentence, or a paragraph. The particular group to stop the system is selected by actuating the desired mode switch. This portion of the system may be operated in any one of the print, nonprint or skip modes and the operator may manually enter information onto the recording device after the the automatic input system has been stopped by the edit control. In this way corrections may be easily entered onto the recording device and the information input device may be corrected.

The margin control provides different degrees of control, designated herein as the margin control, the automatic edit control and the tab control modes of operation. The margin control mode of operation controls the right-hand margin of the output printer according to the preset margin stop to insure that information is not printed on the paper beyond a preselected extension of the margin stop, irrespective of the length of the information group being recorded. This preselected extension is designated the right-hand margin zone and is adapted to cause preselected automatic operations of the automatic input device. The automatic edit mode is utilized to specifically control the data printed in the right-hand margin zone to permit the operator to manually control the amount of data printed in the right-hand margin zone.

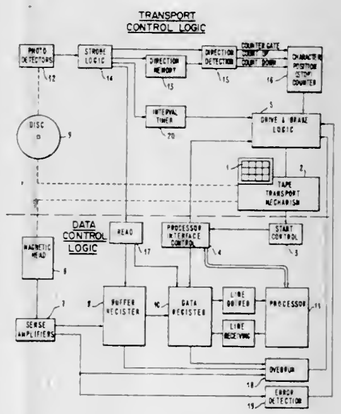
The tab control mode controls the left side margin or the number of tabs starting from the left-hand margin for a given data group. With the system in the margin and tab control modes, the system counts and stores the number of tabs on the first line of the data group, and generates the same number of tabs after a carrier return is acted upon. This stored number of tabs is skipped from the reader after the first line in the data group.

3,579,194
PROCESS FOR DETERMINING THE SIMPLE CYCLES OF A FINITE DIRECTED GRAPH
Herbert B. Weinblatt, Cambridge, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Sept. 4, 1968, Ser. No. 757,315
Int. Cl. G06f *7/00*
U.S. Cl. 340—172.5 **8 Claims**



A machine process based on an algorithm for finding the simple cycles of a finite directed graph wherein each arc of the graph is examined once and only once. Simple cycles are found either when the path of the graph being examined is found to be cyclic or when parts of previously found cycles can be combined with a portion of the path then being examined to form cycles. A general purpose computer program for implementing the algorithm is described.

3,579,195
DATA SYSTEM INCORPORATING METHOD AND APPARATUS FOR REFERENCING MEDIA LOCATIONS
T. Milton Hallmark, and John M. Woodward, Lexington, Ky., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Nov. 5, 1968, Ser. No. 773,471
Int. Cl. G06f *13/04*
U.S. Cl. 340—172.5 **50 Claims**



The invention concerns a data processing system that includes methods and apparatus for establishing accurate

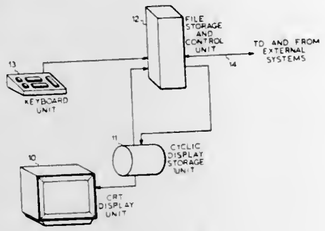
referencing of data locations on a storage media, such as a magnetic tape record media. The system includes a central processor interconnected with a magnetic tape unit having character registers therein and normally operable under command from the processor to read a tape media at relatively high speeds, the data so derived being supplied through the registers to the processor for additional processing. The magnetic tape unit drive is coupled to a disc and photodetection means that supplies coded indications of data locations on the media. The tape unit is operable in a forward direction upon receiving a Read command from the processor and operable in a reverse direction upon receiving a Write-Backspace command, the latter command establishing a pseudowrite operation. In the event the processor does not accept the data characters, or changes commands, or detects an error, provision is made for an overrun operation. During this operation, the last character location not transferred is accurately referenced by counting means while the media is brought to a stop, repositioned in the opposite direction to a point sufficiently removed to insure sufficient acceleration for accurate data reading, and again started in the selected direction during which the overrun occurred. The system inherently provides insurance against mechanical jitter or other mechanical inconsistencies. The system combines counting of character locations on the media with a direction memory to insure that access of characters is accurately maintained.

3,579,196
DATA STORAGE AND DISPLAY SYSTEM

Roland S. Gregg, Jr.; Arnold S. Danberg, and Kenneth N. Larson, Canoga Park, Calif., assignors to The Bunker-Ramo Corporation, Canoga Park, Calif.

Filed Feb. 14, 1969, Ser. No. 799,274
Int. Cl. G11b *13/00*

U.S. Cl. 340—172.5 **14 Claims**



A data storage and display system is provided with a control feature for selectively displaying stored message formats having fields into which data is to be entered by an operator. The feature includes means for insuring that the data entered into each field is of the numeric or alphabetic type if either has been specified on a character-by-character basis. If the operator attempts to enter any other type of character for a given specified character, an error is indicated and a correct character must be entered before proceeding to the next character in the same or different field. There is also provision for determining whether entries in all fields have been completed before the message format can be transferred to a file storage and control unit.

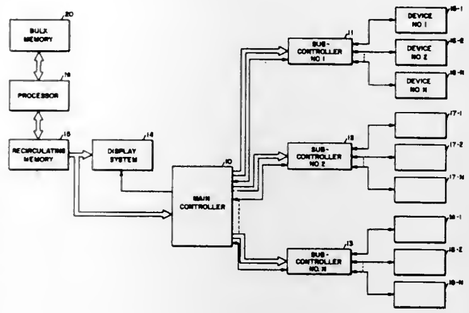
3,579,197
APPARATUS FOR PROGRAMMABLE CONTROL OF ELECTROMECHANICAL DEVICES

Gary N. Stapleford, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 28, 1969, Ser. No. 803,371
Int. Cl. G06f *9/00*

U.S. Cl. 340—172.5 **35 Claims**

Instructions having a simple format are sued to control several classes of electromechanical devices such as slide projectors, tape recorders, movie projectors, X–Y positioning devices, etc. The instructions are stored in a recirculating memory and are monitored by a main controller. The main



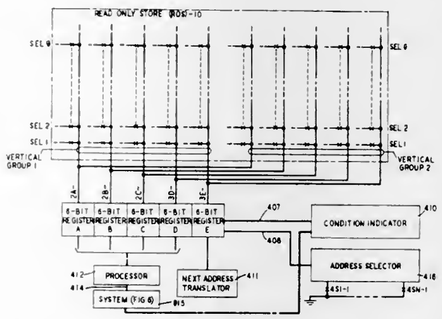
controller is coupled to one or more subcontrollers, each subcontroller being used to control one of the class devices. When the main controller is activated, an instruction is enabled into a designated subcontroller by means of the main controller. The instruction is then executed by the subcontroller. After execution, the apparatus is recycled by a signal from either of the subcontrollers. In addition, more than one subcontroller may be executing instruction words simultaneously, thereby allowing two or or more different class devices to be operating simultaneously. Furthermore, the apparatus may be used in conjunction with a display system, thereby allowing display of text associated with an instruction simultaneously with the execution of the instruction.

3,579,198
MICROPROGRAMMED WIRED LOGIC MEMORY

John A. Giunta, Long Branch, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 28, 1969, Ser. No. 811,440
Int. Cl. G06f *9/14*

U.S. Cl. 340—172.5 **11 Claims**



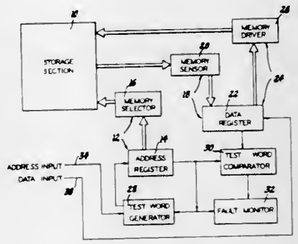
A microprogrammed logic system containing a crossbar switch read-only-store is arranged to control small electromechanical switching networks. The crossbar switch has a discrete voltage potential on each crosspoint representing, in binary format, either a "O" or a "I". Each horizontal row of the switch corresponds to the memory address of one instruction and upon selection enables the operating of a group of hold magnets thereby closing a predetermined number of crosspoints. Upon crosspoint closure, an instruction, containing as many binary bits as there are closed crosspoints, is available for use by the microprogrammed logic system.

3,579,199
METHOD AND APPARATUS FOR FAULT TESTING A DIGITAL COMPUTER MEMORY

Robert A. Anderson; Alfred H. Faulkner, Santa Barbara, Calif., and Edwin L. Hughes, Brookfield, Wis., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 3, 1969, Ser. No. 795,938
Int. Cl. G06f *11/04*

U.S. Cl. 340—172.5 **8 Claims**



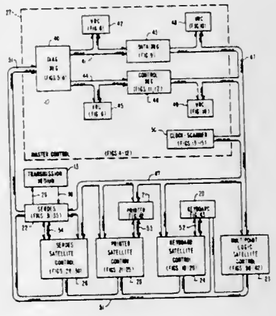
A digital computer memory is interrogated so as to test its operation. A digital word generator addresses the computer memory with a plurality of test address words identical to a plurality of test data words stored within word storage locations accessed by the test address words. The data words collectively include all coefficients of all powers of the radix of the numerical address code utilized by the digital computer. A digital word comparator detects any noncorrespondence between the test data words retrieved from the accessed word storage locations and the test address words thereby to indicate the presence of a fault within the computer memory.

3,579,200
DATA PROCESSING SYSTEM

Robert H. Davis, Raleigh, and Jerry S. Harris, Cary, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 30, 1969, Ser. No. 846,011
Int. Cl. G06f *11/08;* **H04l** *1/00*

U.S. Cl. 340—172.5 **45 Claims**



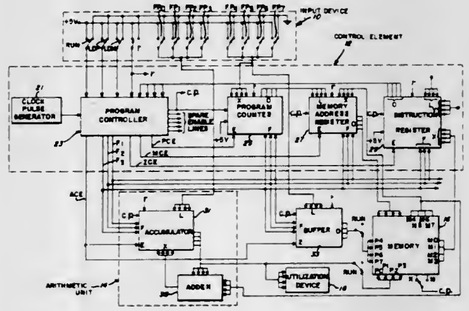
A data processing system including a plurality of terminals connected to a transmission medium for sending and receiving data and control signals between terminals is provided, and each terminal includes a master control connected by bus means having data lines and control lines to a plurality of satellite controls and input-output, devices. A first parity checking device checks the parity of the signals on the control lines from each satellite to the master control, and a second parity checking device checks the parity of the signals on the control lines from the master control to the satellite controls. Even or odd parity may be used, but odd parity is preferred. Each satellite control includes a plurality of circuits interconnected to perform the control function of such satellite control, and each one of the plurality of circuits has an output line connected to an odd number of other such circuits, whereby a malfunction in any one of said plurality of circuits affects an odd number of control lines from such satellite control which thereby forces the first parity checking device to detect a malfunction. Each satellite control, for the odd parity case, supplies a control signal on a single given control line when it is not active, whereby the first parity checking device checks the status of each satellite control during both the active and the inactive states.

3,579,201
METHOD OF PERFORMING DIGITAL COMPUTATIONS USING MULTIPURPOSE INTEGRATED CIRCUITS AND APPARATUS THEREFOR

Frank J. Langley, Carlisle, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sept. 29, 1969, Ser. No. 861,750
Int. Cl. G06f *1/00*

U.S. Cl. 340—172.5 **5 Claims**



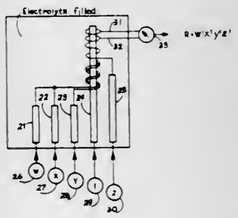
A digital computer, exemplifying a method of organizing and controlling the elements of a general or special purpose computer, incorporating identical multipurpose integrated circuits in the control and/or arithmetic elements, each one of such circuits being responsive to the combination of commonly applied clock pulses and coded function signals and a unique enable signal. With such an arrangement, a basic design of such control and/or arithmetic elements may be changed to expand word length, memory capacity or instruction repertoire by connecting similar multipurpose integrated circuits to existing ones as required.

3,579,202
ELECTROCHEMICAL INHIBIT GATE

Robert M. Stewart, Encino, Calif., assignor to Aerojet-General Corporation, El Monte, Calif.

Filed Oct. 2, 1967, Ser. No. 673,252
Int. Cl. G11c *13/02*

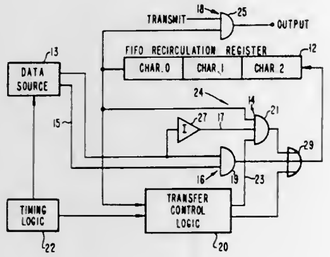
U.S. Cl. 340—173CH **7 Claims**



An inhibit gate for data processing systems utilizing electrochemical waves of polarization as the basic signalling mechanism employing a pair of electrodes immersed in an electrolyte is disclosed. The inhibit gate employs preferably

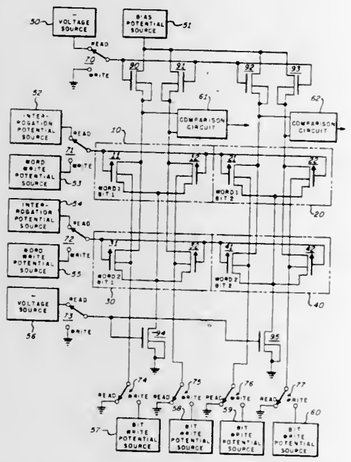
iron and gold as the active materials in an electrolyte of nitric acid. Inhibit operation is achieved by the particular composition, size and placement of two electrodes. In one form, the inhibit gate exhibits adaptive properties.

3,579,203
RECIRCULATING BUFFER MEMORY
Michael M. Malmer, Jr., Livonia, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Filed Dec. 12, 1968, Ser. No. 783,252
Int. Cl. G11c *19/00, 21/00*
U.S. Cl. 340—173RC **4 Claims**



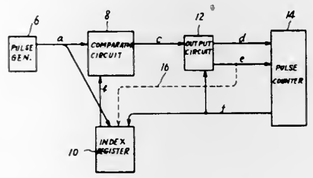
The disclosure embodies a dynamic, first-in-first-out buffer memory and includes means for selectively and sequentially recirculating and advancing the relative positions of the binary encoded data therein.

3,579,204
VARIABLE CONDUCTION THRESHOLD TRANSISTOR MEMORY CIRCUIT INSENSITIVE TO THRESHOLD DEVIATIONS
Andrew James Lincoln, Concord, Mass., assignor to Sperry Rand Corporation
Filed Mar. 24, 1969, Ser. No. 809,899
Int. Cl. G11c *11/40*
U.S. Cl. 340—173 **5 Claims**



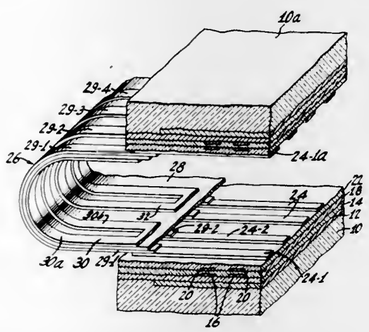
A memory circuit for application in a computer memory for storing a binary valued digit. The circuit comprises two insulated gate field effect transistors characterized by electrically controllable conduction thresholds established by potentials applied between the respective gate electrodes and substrates. A binary digit is stored by establishing a difference in threshold between the two transistors and is read by sensing the difference in current flow therebetween in response to an interrogation potential applied to the gate electrodes thereof. The binary value ONE or ZERO is stored by establishing a higher threshold for one transistor with respect to the other or for the other transistor with respect to the one.

3,579,205
PULSE COUNTING DEVICE WITH MEMORY
Takashi Aga, Akashi-shi, and Masami Yamanaka, Miki-shi, Japan, assignors to Yamato Scale Company, Limited, Akashi-shi, Japan
Filed Sept. 5, 1969, Ser. No. 855,565
Claims priority, application Japan, Nov. 21, 1968, 43/85,415
Int. Cl. G11c *13/04*
U.S. Cl. 340—173R **5 Claims**



Pulse counting circuit for measuring devices such as scales and the like wherein pulses are produced by motion of the measuring device and fed to a memory element. The memory element produces a second set of pulses which are compared in phase with the original pulses. The phase difference information and pulse count information are used to produce addition and subtraction instruction signals which signals are in turn used to produce a count confirming signal which is fed to the memory element to effect coordination of the original count stored therein with the count confirming signal.

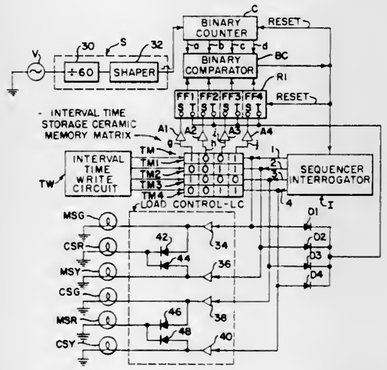
3,579,206
LOW INDUCTANCE INTERCONNECTION OF CRYOELECTRIC MEMORY SYSTEM
Robert A. Grange, Belle Mead, N.J., assignor to RCA Corporation
Filed Dec. 16, 1968, Ser. No. 784,019
Int. Cl. G11c *5/06;* **H05k** *7/06*
U.S. Cl. 340—173.1 **9 Claims**



A length of flexible insulating material such as Mylar or Kapton having parallel conductors on one surface and including a magnetic field shield insulated from the conductors. The parallel conductors are connected at one end to lines at one edge of one cryoelectric memory plane and at the other end either to lines at the corresponding edge of the next adjacent plane, or to a terminal bar whose lines and shield are similar to that of the memory plane. The adjacent plane, in this case, is also connected to the terminal bar but via a second connector such as described. The shield comprises side-by-side diescrete conductive sections insulated

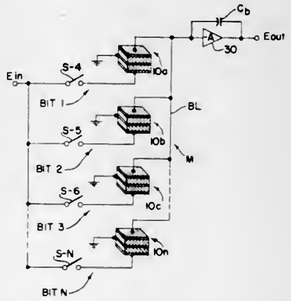
from one another, each section registering with, that is, lying under (or over) a pair of conductors. Each adjacent pair of conductors is driven in such manner that one carries current in one direction and the other "simultaneously" carries an equal amount of current in the opposite direction.

3,579,207
LOAD SEQUENCER CONTROLLER
Peter G. Bartlett, Bettendorf, Iowa, and Joseph E. Meschi, Lyons, Ill., assignors to Gulf & Western Industries, New York, N.Y.
Filed Nov. 14, 1967, Ser. No. 682,814
Int. Cl. G11c *11/22*
U.S. Cl. 340—173.2 **31 Claims**



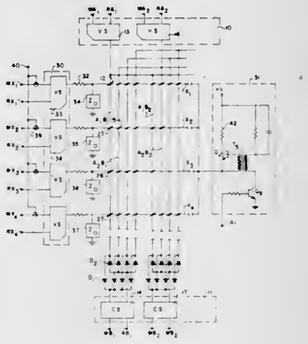
A load sequencer controller is disclosed herein which serves to sequentially allocate and time a plurality of load intervals. The controller includes a plurality of interval time storage memories, each corresponding with an associated load interval to be timed. Each of the memories includes a plurality of electrically alterable and interrogatable bistable memory means which serve to store binary information. The weighted binary content of each memory is a decimal number representative of a desired time duration for an associated load interval. An interrogation circuit serves to sequentially apply interrogation signals to the memories so that when any one memory is interrogated the output of that memory provides a pattern of binary signals. An actuating circuit receives pulses from a source of equi-time-spaced pulses and serves to actuate the interrogation circuit each time the decimal number of the received pulses is equal to the decimal weight of the pattern of binary signals of the memory last interrogated.

3,579,208
CERAMIC MEMORY AMPLIFIER
Peter G. Bartlett, Davenport, Iowa, assignor to Gulf & Western Industries, New York, N.Y.
Filed Feb. 28, 1969, Ser. No. 812,521
Int. Cl. G11c *9/02*
U.S. Cl. 340—173.2 **9 Claims**



There is disclosed herein a ceramic memory system including a ceramic memory matrix comprised of a plurality of ceramic memory devices each having a first and a second surface respectively connected to a plurality of electrically conductive bit lines and a common line. The bit lines of the ceramic memory device are connected in common to an amplifier having parameters such that when one of the ceramic memory devices is interrogated, the output signal developed by the amplifier is not degraded by the impedance of the remaining ceramic memory devices.

3,579,209
HIGH SPEED CORE MEMORY SYSTEM
Thomas J. Gilligan, Palos Verdes Pennisula, and Arthur T. Nozaki, Torrance, Calif., assignors to Electronic Memories, Incorporated, Hawthorne, Calif.
Filed Sept. 6, 1968, Ser. No. 758,076
Int. Cl. G11c *5/02, 11/06*
U.S. Cl. 340—174 **17 Claims**

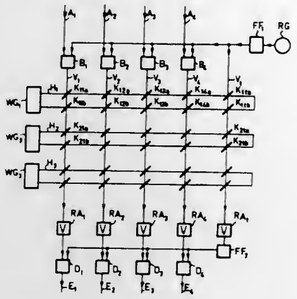


A magnetic core memory system is disclosed comprising a rectangular array of magnetic cores. A first plurality of independent wires thread cores along one axis and a second plurality of dependent wires thread cores along the other axis for coincident-current selection of cores to be switched. The second plurality of wires are current dependent in that the current through a selected wire is returned in the opposite direction through unselected wires in parallel. In that manner, a selected core may be overdriven with more than half-select current I_h in one of the first plurality of wires and half-select current I_h in one of the second plurality of wires. The unselected cores threaded by the overdriven wire receive a net current of I_h due to return current through unselected ones of the second plurality of wires.

3,579,210
MATRIX STORAGE DEVICE
Heinrich Eduard Van Bruck, and Theodoor Holtwijk, Emmasingel, Eindhoven, Netherlands, assignors to U.S. Phillips Corporation, New York, N.Y.
Filed Mar. 24, 1969, Ser. No. 809,704
Claims priority, application Netherlands, Apr. 10, 1968, 6,805,155
Int. Cl. G11c *7/04, 5/02, 11/06*
U.S. Cl. 340—174 **4 Claims**

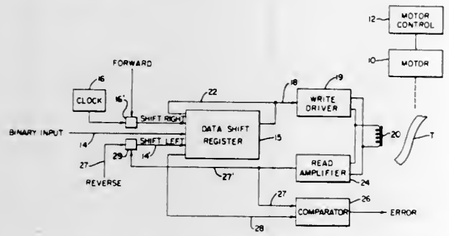
In order to reduce stray of the output voltage in reading information from a magnetic matrix store, the information is written as many times in the inverted state as in the noninverted state, on average, so that the heat dissipation on an

average is the same for all cores. The inverted or noninverted state of the written information is recorded by an auxiliary



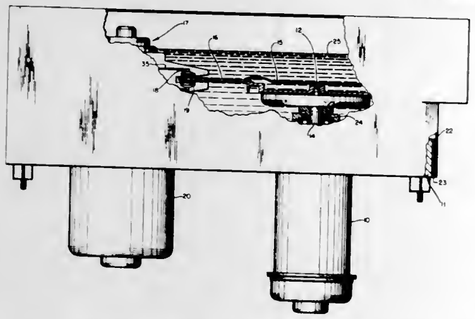
core joined to each word, which core is read when the information of the word concerned is read.

3,579,211
READ-AFTER-WRITE VERIFICATION OF DATA ON MAGNETIC STORAGE MEDIUM
Raymond B. Larsen, Riverton, Wyo., assignor to Datel Corporation, Falls Church, Va.
Filed Oct. 11, 1968, Ser. No. 766,677
Int. Cl. G11b *5/44*
U.S. Cl. 340—174.1 **14 Claims**



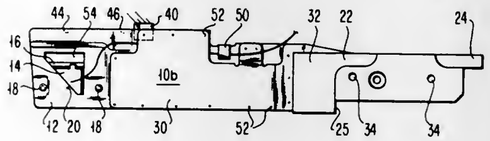
Verification of data recorded on a magnetic storage medium is accomplished by reversibly driving the medium past a common record/reproduce head in order to successively record and play back each character of information and to verify the data recorded by comparing the information played back with the input data supplied for recording.

3,579,212
A REPRODUCING HEAD IN A LIQUID MEDIUM
Andrew Gabor, Bedford, Mass., assignor to Honeywell, Inc., Minneapolis, Minn.
Filed Mar. 5, 1968, Ser. No. 710,506
Int. Cl. G11b *5/60*
U.S. Cl. 340—174.1E **6 Claims**



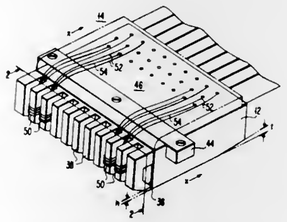
High density storage magnetic recording systems are described in which the reproducing transducers must be positioned in accurately maintained close proximity to the surface of the recording medium. Both transducers and recording medium are immersed in a liquid so that relative motion between the recording surface and the transducers develops a liquid film of controlled thickness for maintaining uniform close spacing.

3,579,213
MAGNETIC HEAD ACCESSING MECHANISM UTILIZING SPRING BIAS
Roy A. Applequist, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 17, 1968, Ser. No. 722,007
Int. Cl. G11b *5/60*
U.S. Cl. 340—174.1E **4 Claims**



A magnetic head support assembly, particularly useful for noncontact recording, includes a head support arm formed with a spring-loaded portion, and incorporates a ramp that cooperates with a stationary cam to effectuate proper loading of the head to a magnetic record surface. The support arm may be actuated bidirectionally, so that the magnetic transducer is precisely positioned at a desired track and properly spaced from the surface of the record medium or disc during record and playback, or retracted to a rest position.

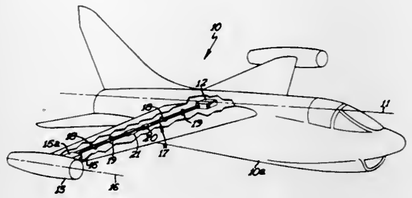
3,579,214
MULTICHANNEL MAGNETIC HEAD WITH COMMON LEG
Erik R. Solyst, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 17, 1968, Ser. No. 737,759
Int. Cl. G11b *5/28*
U.S. Cl. 340—174.1F **1 Claim**



A read-write head assembly incorporates multiple transducing elements in an integral ferromagnetic structure, all elements being jointed to a common ferromagnetic leg to complete the magnetic circuit. The common leg serves as an air bearing slider for noncontact recording.

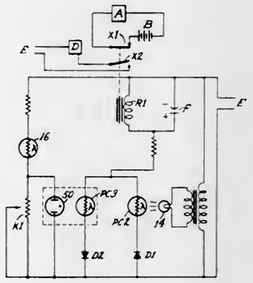
3,579,215
METHOD AND APPARATUS FOR CONDUCTING A SIGNAL
Denis R. Brasket, 3313 Croft Drive, St. Anthony Village, Minn.
Filed Sept. 26, 1966, Ser. No. 581,858
Int. Cl. G08c *19/48*
U.S. Cl. 340—198 **6 Claims**

A cablelike device designated as a vector conduit comprised of a plurality of rigid sections coupled together at articulating joints permitting relative angular movement therebetween is utilized to transmit a directional signal from a signal generator on a first space platform, such as an aircraft fuselage, to a signal receiver located on a second space platform which is not rigidly connected to the first platform,



such as a wing tip of the aircraft. A mechanical device, such as a rocket launcher, on the aircraft wing tip is oriented on the desired directional path by the signal receiver in response to a signal transmitted through the vector conduit from a sighting device on the first space platform. An electromechanical device operatively associated with each of the articulating joints in the vector conduit is utilized to measure or sense the angular displacement between the rigid sections of the vector conduit and to make a corresponding correction in the directional signal, thereby compensating for angular deviation between the first and second space platforms to insure that the signal receiver properly positions and orients the mechanical device, i.e., the rocket launcher, in the desired directional path.

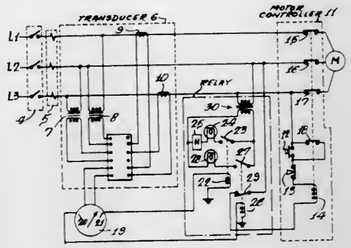
3,579,216
PARTICLE DETECTOR
Alfred W. Vasel, 222 Linwood St., Abington, Mass. 02351
Continuation of application Ser. No. 533,140, Mar. 10, 1966, now abandoned. This application July 8, 1969, Ser. No. 845,646
Int. Cl. G08b *17/10, 19/00*
U.S. Cl. 340—237 **2 Claims**



A smoke detector in which a light for illuminating smoke particles also illuminates a photocell providing a circuit path to maintain an alarm actuating device in a deenergized condition, and means is provided responsive to the detection of smoke to illuminate a second photocell to cause energization of the alarm.

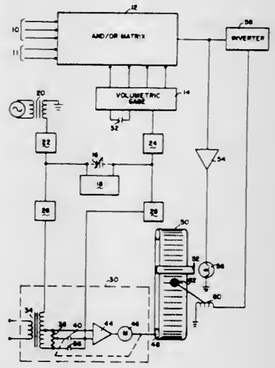
3,579,217
METHOD AND APPARATUS FOR DETECTING AND INDICATING MALFUNCTION OF A TABLETING MACHINE
Thomas J. Casey, Arlington Heights, and George F. Loeffler, Barrington Hills, Ill., assignors to Thomas Machinery Corporation, Hoffman Estates, Ill.
Filed June 10, 1968, Ser. No. 735,737
Int. Cl. G08b *21/00*
U.S. Cl. 340—253 **5 Claims**

Method and means for monitoring a multistation tableting machine with respect to the forces applied by tablet-forming punch means to tablets successively formed in and ejected from said machine which comprises continuously measuring



the electric power requirement of said machine with respect to predetermined overload and underload norms of operation.

3,579,218
ATTITUDE ERROR DETECTION FLUID GAUGING SYSTEM WITHOUT CORRECTION
Arthur M. Forsythe, Jr., Shelburne, Vt., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.
Filed Sept. 4, 1968, Ser. No. 757,375
Int. Cl. G08b *21/00*
U.S. Cl. 340—253 **5 Claims**

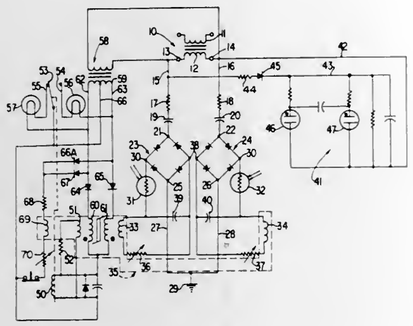


An aircraft fuel gauging system which is coupled to a standard mass fuel gauge and accepts signals from the aircraft pitch and roll sensors to produce an output signal which indicates whether or not the mass fuel gauge can be accurately read. The output signal may be used to actuate a warning signal flag or a red light at the fuel indicators to signal the pilot that the indicator is unreliable and that the aircraft attitude must be changed to obtain an accurate fuel reading.

3,579,219
LEAKAGE-CURRENT DETECTOR
Bodo M. Wolfframm, Claredon Hills, Ill., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.
Filed Nov. 19, 1968, Ser. No. 776,893
Int. Cl. G08b *21/00*
U.S. Cl. 340—255 **11 Claims**

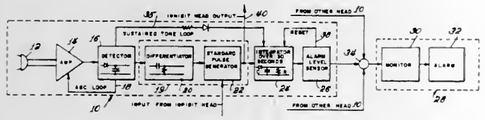
A leakage current or fault detector for isolated power lines in which independent detection circuits each including identical R-C networks operate sequentially from each line to ground. Any fault is fed into a magnetic summing amplifier

which is of the fail-safe type and drives an indicating relay. The fault may be either capacitive or resistive, or both, and is



detected on either or both lines, including a symmetrical fault. The detection circuits may be sequentially sampled by electronically operated photosensitive devices.

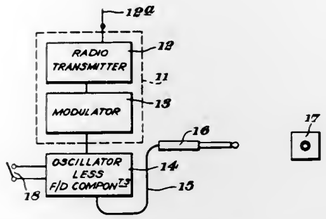
3,579,220
ALARM SYSTEM
Louis A. Stevenson, Jr., Houston, Tex., assignor to "Automatic" Sprinkler Corporation of America
Filed Mar. 28, 1969, Ser. No. 811,515
Int. Cl. G08b *13/00*
U.S. Cl. 340—258 **16 Claims**



An alarm system having a plurality of disturbance-detecting head means each such head including circuitry for evaluating the disturbance detected and for generating an output when the disturbances detected are alien to the area being monitored. A system circuit capable of assuming different distinct states interconnects the plurality of head means with an alarm. The system circuit changes from one of its states to another of its states in response to the generation of an output from any of the detection heads to thereby trigger the alarm. The alarm may also be triggered as a result of any tampering with the heads or the circuit or as a result of loss of power in the system.

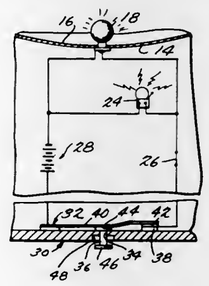
3,579,221
ALARM SYSTEM
John Raymond Ashley, "Kyama" Frome Road, Radstock, Bath, Somerset, and Colin Grahame Douglas, "Stoneybroke" Watergates, Colerne, Wiltshire, England
Filed May 31, 1968, Ser. No. 733,692
Claims priority, application Great Britain, May 31, 1967, 25200/67
Int. Cl. G08b *29/00*
U.S. Cl. 340—277 **1 Claim**

An alarm system for use in conjunction with a radio actuated location system in which a security guard or watchman carries a radio transmitter which transmits signals according to the location of the guard, the alarm system including circuitry to generate an alarm frequency, the guard having a switch (which may operate automatically if he is incapacitated) which, when actuated, causes the alarm



frequency to be transmitted (or cut off if it is normally being transmitted).

3,579,222
PORTABLE BURGLAR ALARM
Wilbern Marvin Freeman, 907 N.E. 111th St., Miami, Fla.
Filed Jan. 25, 1968, Ser. No. 700,534
Int. Cl. G08b *13/08, 13/00*
U.S. Cl. 340—283 **6 Claims**



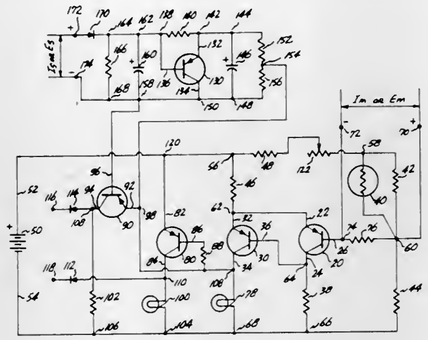
The burglar alarm is compact, self-contained and has no significant protrusions, but for a push rod which is pushed in flush with the case when the alarm is supported on its base or when the base is pushed against an object of value. The push rod engages a leaf spring-type switch maintaining it "open;" removal of force from the push rod allows the switch to extend the push rod and close actuating an alarm, for instance a buzzer and a light recessed in the top of the case. This will happen when the burglar alarm is tipped over or the object of value is moved from engagement with the push rod.

The foregoing abstract is not intended to be a comprehensive discussion of all of the principles, possible modes or applications of the invention disclosed in this document and should not be used to interpret the scope of the claims which appear at the end of this specification.

3,579,223
TRANSISTORIZED MONITORING CIRCUIT
Arthur B. McKaig, Bellevue, Wash. (P.O. Box 228, Belfair, Wash. 98528)
Filed June 25, 1968, Ser. No. 739,835
Int. Cl. G08b *21/00*
U.S. Cl. 340—248 **4 Claims**

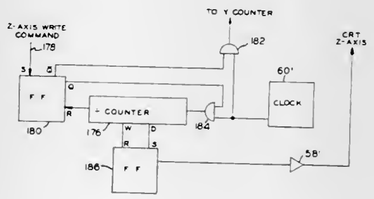
The invention consists of modifications and improvements to the monitoring circuit of U.S. Pat. No. 3,293,630. These changes increase the sensitivity and accuracy of the monitoring circuit by an improved interconnection with the monitored circuit, provide an adjustment to compensate for manufacturing tolerances in components, provide an adjustment for matching the monitoring circuit to the monitored

circuit, eliminate problems with alternating current waveshape in the monitored circuit, eliminate false indica-



tions by effective use of time delay circuits and furnish more usable monitoring information by including a gating circuit.

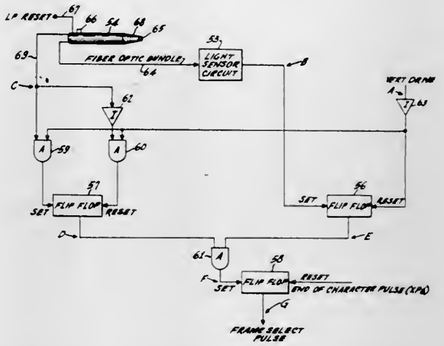
3,579,224
CHARACTER GENERATOR APPARATUS
John R. Griffin, Portland, and Charles A. Forsberg, Tigard, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.
Filed Dec. 9, 1968, Ser. No. 782,396
Int. Cl. H01j *29/70*
U.S. Cl. 340—324 **11 Claims**



A character generator apparatus provides deflection signals to a cathode-ray storage tube for causing the electron beam thereof to move through a fixed pattern of dots called a dot matrix. The prospective movement of the electron beam through the dot matrix is very rapid. Input translating means detect when a particular location in the dot matrix is reached at which an elemental portion of the character is to be written by the electron beam. At this time, the electron beam is slowed down and enabled so this elemental portion is displayed and stored by the cathode-ray tube.

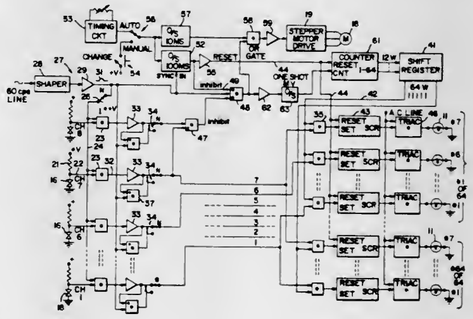
3,579,225
LIGHT PROBE CIRCUIT FOR PERSISTENT SCREEN DISPLAY SYSTEM
Robert John Clark, Dorion, Quebec, Canada, assignor to RCA Corporation
Filed Oct. 15, 1969, Ser. No. 866,552
Int. Cl. G06f *3/14*
U.S. Cl. 340—324A **8 Claims**

The light sensed by a light "probe" or "pen" during each field displayed on a persistent screen causes a signal to be stored for a duration which is a fraction of the field time. The placing of the probe in a light sensing position causes a second signal of a duration at least equal to one field time to be stored and which starts at a time after the pen is placed in its light sensing position at which the next field starts. A circuit responsive to the concurrent presence of both stored



signals produces an output pulse which may be employed to signal the computer associated with the light probe.

3,579,226
MULTIPOINT CONTROL SYSTEM
Robert J. Strehlow, Sunnyvale, Calif., assignor to Wehr Corporation, Milwaukee, Wis.
Filed Nov. 13, 1967, Ser. No. 682,123
Int. Cl. G08b *5/36*
U.S. Cl. 340—339 **10 Claims**

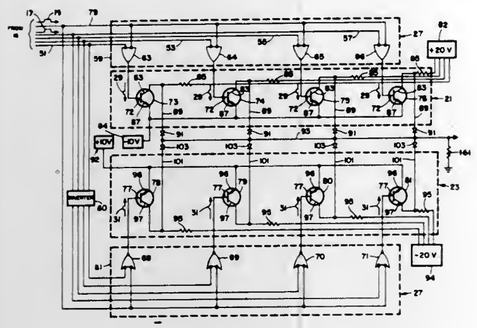


A multipoint control system provides visual display of a message with a matrix of light sources arranged in columns and rows. An input tape is coded with the display information by blacking out certain squares of the tape format which is similar to the display format or punching holes in the tape. The tape is then passed over a column of photosensitive devices and the information transferred to silicon controlled rectifiers which drive triacs coupled to the light sources. A shift register provides for sequential activation of the respective display columns of the light sources. The coded format tape is indexed and synchronized with the activation of the light sources of the various columns.

3,579,227
DIGITAL-TO-ANALOG CONVERTER SYSTEM
James W. Appelgren, Highland Park, Ill., assignor to The Louis Allis Company, Milwaukee, Wis.
Filed May 17, 1968, Ser. No. 730,170
Int. Cl. H03k *13/04*
U.S. Cl. 340—347 **7 Claims**

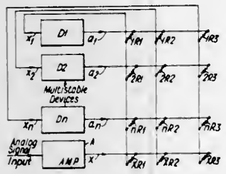
The D/A converter system includes a positive D/A converter and a negative D/A converter having common outputs connected to ground. Logic circuitry provided for each D/A

converter is responsive to a polarity control signal for disabling one D/A converter from producing an analog output



signal of one polarity while enabling the other D/A converter to produce an analog output signal of the other polarity in response to a digital input signal from a digital controller. Power supplies bias the positive and negative D/A converters to isolate the analog output signal generated by the enabled D/A converter from the disabled D/A converter.

3,579,228
ANALOG-TO-DIGITAL CONVERTER
Kenneth William Cattermole, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Jan. 26, 1968, Ser. No. 700,874
Claims priority, application Great Britain, Feb. 10, 1967, 6509/67
Int. Cl. H03k *13/17*
U.S. Cl. 340—347 **10 Claims**



An equilibrium type coder comprising an array of multistable and weighted stages interconnected with each other and the analog input to provide an input signal to each stage including the analog signal and weighted functions of the output signal of each stage. The weights of each stage as provided by weighted interconnects, or different biasing of the stages are such that the array has a plurality of stable states each corresponding to a different amplitude of the analog signal. The digital representation of the analog signal is provided by the state of the stages when the array is in a stable state.

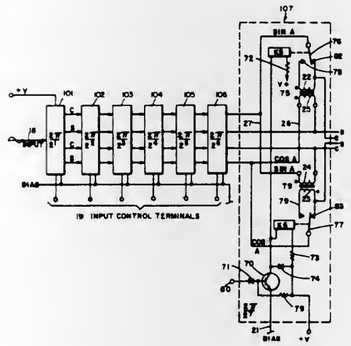
3,579,229
PRECISION SWITCHING NETWORK FOR A DIGITAL TO ANALOG CONVERTER
Robert W. Tripp, Tuckahoe, N.Y., assignor to Inductosyn Corporation, Carson City, Nev.
Filed Oct. 30, 1968, Ser. No. 771,748
Int. Cl. H03k *13/04*
U.S. Cl. 340—347DA **9 Claims**

A system for converting a digital number such as an angle into analog signals representing the sine and cosine of the angle including a plurality of network stages representing binary bits of 360°. A control activates certain stages whereby the sum of the corresponding bits represents the selected angle. The stages of major significance include inputs and transformers for generating output signals to serve as inputs to the stages of minor significance, such output signals being computed by stages in tandem operating in accordance with equations 1 and 2, column 3 of U.S. Pat. No. 2,849,668. The stages of minor significance operate in accordance with the following equations 3 and 4 of the above patent:

$$\sin(a+b) = \tan b \cos a + \sin a \qquad (3)$$

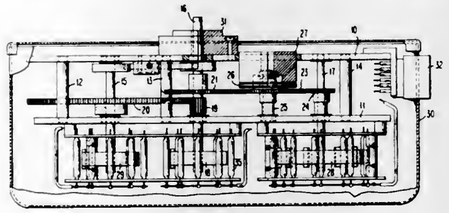
$$\cos(a+b) = \cos a - \tan b \sin a \qquad (4)$$

In equation 3 the term "cos a" is the output of the last stage of major significance, the term "tan *b*" being a first transformer having a primary winding common to all of the stages of minor significance, the first transformer having a seconda-



ry winding individual to each stage of minor significance, the secondary windings connected in series, each secondary winding being activated by a transistor circuit, and the active secondary windings supplying an output to a second transformer. The first transformer has a turns ratio increasing its binary bit value by a certain factor and the second transformer decreases the output by the same factor whereby the signal proportional to "tan *b* cos *a*" in the secondary winding of the second transformer is restored to normal prior to being combined with the signal "sin *a*" from the stages of major significance to form the final sine output. A similar transformer and secondary winding arrangement is provided for the signal according to "tan *b* sin *a*" for equation 4 prior to algebraic summing with the term "cos *a*" from the stages of major significance to form the final cosine output.

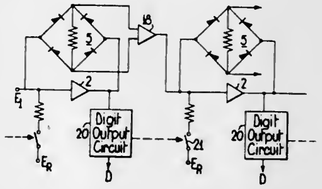
3,579,230
DIGITAL TRANSDUCER AND MEMORY SYSTEM THEREFOR
James H. Casterlin, Binghamton, N.Y., assignor to Quantametric Devices, Inc., Johnson City, N.Y.
Filed June 17, 1968, Ser. No. 737,714
Int. Cl. G08c *9/04*
U.S. Cl. 340—347 **6 Claims**



A transducer for indicating the extent of rotation of a shaft in digital units consists of several intergeared rotating circuit closure devices coupled to the shaft, each representing a

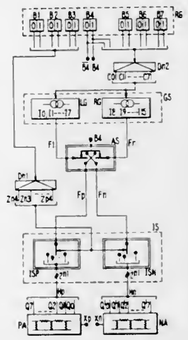
decade in the numerical system. The closure devices operate, by magnetic attraction, reed switches connected to relay circuits. Each closing and subsequent opening of a circuit connected to the closure devices prepares the eventual actuation of a particular relay designating a digit in each decade. A holding circuit for each relay maintains closure of the relays energized at the time when the rotation of the closure device is momentarily stopped for interrogation of the transducer.

3,579,231
CODE TRANSLATION CIRCUITS
Piotor Bylanski, London, England, assignor to The General Electric and English Electric Companies Limited, London, England
Filed Sept. 17, 1968, Ser. No. 760,269
Int. Cl. H03k *13/17*
U.S. Cl. 340—347 **4 Claims**



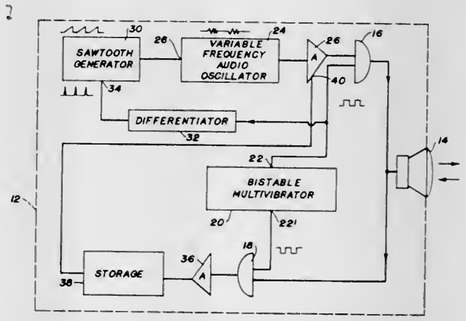
A P.C.M. coder using the Waldhauer principle (see U.S. Pat. No. 3,187,325), of incorporating a current-switching decision-device in an amplifier feedback loop, in which each coding stage has only a single high-gain amplifier. In each such stage, the input analogue signal to the stage and a reference voltage are supplied to the amplifier and four diode rectifiers are connected in a bridge circuit in a feedback path across the amplifier. The amplifier of each stage supplies a digital signal representing the coding effected by that stage and the analogue output signal for passing onto the next stage is developed across a resistor which is connected across one diagonal of the bridge circuit.

3,579,232
NON-LINEAR DIGITAL TO ANALOG DECODER WITH A SMOOTH CHARACTERISTIC
Pierre Girard, Paris; Claude Paul Henri Lerouge, Maurepas, and Marc Andre Regnier, Aulnay-Sous-Bois, France, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Apr. 23, 1969, Ser. No. 818,554
Claims priority, application France, Apr. 30, 1968, 150085
Int. Cl. H03k *13/04*
U.S. Cl. 340—347 **6 Claims**



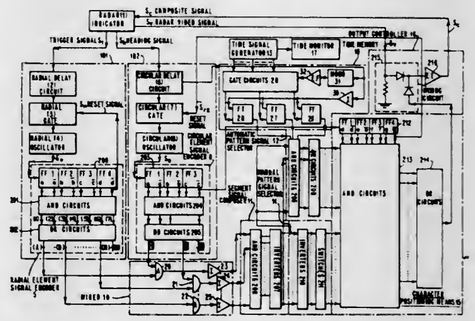
A digital to analog decoder or converter is disclosed. The decoder has a smooth nonlinear characteristic of the hyperbolic sine type. This smooth characteristic is contrasted to a nonlinear characteristic approximated by a plurality of straight line segments in the prior art. The decoder of this case includes a register to store a 7-digit code to be decoded. A first decoder circuit decodes the last four digits of the 7-digit code. Two groups of current generators (a first selection circuit) responding to the output of the first decoder produce two currents. A bipolar inverter (a second selection circuit) responding to the first of the last four digits directs the two currents to a third selection circuit. The third selection circuit responds to the output of of a second decoder to direct the two currents to the appropriate one of two ladder attenuators, the outputs of which produce the analog signal. The second decoder responds to the first three digits of the 7-digit code.

3,579,233
AMBIENT NOISE FREQUENCY RESPONSIVE AUDIBLE VEHICLE ALARM
Herbert A. Raschke, Greenbrae, Calif., assignor to E. D. Bullard Company, Sausalito, Calif.
Continuation-in-part of application Ser. No. 571,779, Aug. 11, 1966, now abandoned. This application Jan. 27, 1969, Ser. No. 813,786
Int. Cl. G08b *23/00*
U.S. Cl. 340—384E **6 Claims**



A vehicle alarm system which has an ambient noise sensor, an alarm signal generator, and a system responsive to the sensor for varying the output frequency of the generator so as to produce a warning signal that has a frequency other than the frequency of the ambient noise.

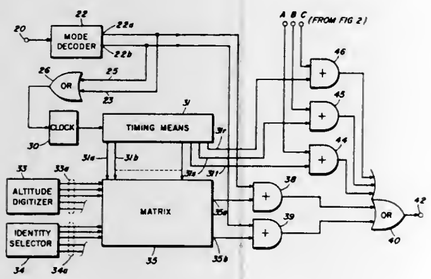
3,579,234
CHARACTER GENERATOR FOR RADAR DISPLAY
Takao Tsumura; Toshio Kaoka; Keisuke Suzuki; Yoshiaki Ueda, and Naoyoshi Oishi, Tokyo, Japan, assignors to Japan Radio Company, Limited, Tokyo, Japan
Filed May 14, 1969, Ser. No. 824,514
Claims priority, application Japan, May 15, 1968, 43/32655
Int. Cl. G01s *7/12, 7/22*
U.S. Cl. 343—5 **19 Claims**



A character-generating system for use with a radar system wherein coded radial element signals and coded circular ele-

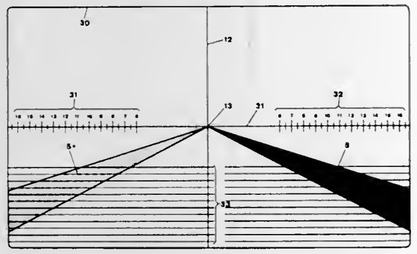
ment signals are generated in response to the trigger and heading signals, respectively, generated by the radar system. The coded radial and circular element signals are combined to form a plurality of pattern signals representing a plurality of characters. The pattern signals are then selected and combined with the video radar information to form a composite signal which is fed to the radar display.

3,579,235
COLLISION AVOIDANCE READOUT ON AIR TRAFFIC CONTROL RADAR BEACON SYSTEMS
Kenneth Luke Straub, Fort Lauderdale, and Wayne Gregory Shear, Pompano Beach, Fla., assignors to The Bendix Corporation
Filed June 18, 1969, Ser. No. 834,432
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.5 **5 Claims**



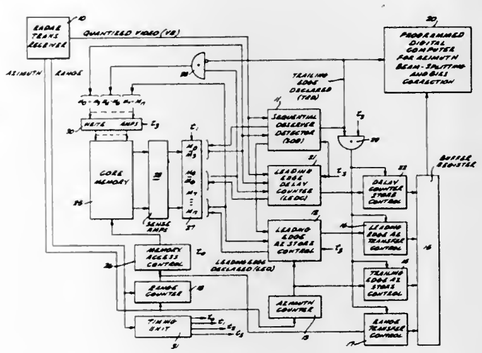
A system for transmitting collision avoidance maneuvering information together with conventional air traffic control information by the same aircraft transponder. The transponder includes gating apparatus for adding in a serial format both the maneuvering and the control information in order to transmit a single combined response to a single air traffic controller interrogation.

3,579,236
TEMPLATE FOR EVALUATING PHOTOGRAPHS OF DOPPLER RADAR SPEED MEASUREMENTS
Kurt Wilhelm Piechocki, Uster, Switzerland, assignor to Zellweger, Ltd., Uster, Switzerland
Filed Jan. 24, 1969, Ser. No. 793,685
Claims priority, application Switzerland, Feb. 28, 1968, 2915
Int. Cl. G01s *9/44*
U.S. Cl. 343—8 **9 Claims**



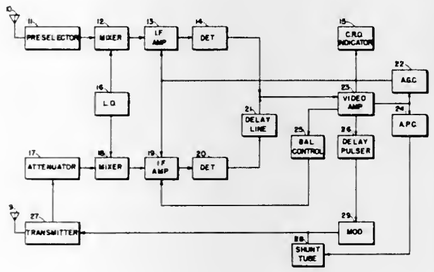
A doppler radar vehicle speed measurement template is provided with a representation of the photograph zone intersecting with a horizontal line representing the horizon of the road and a vertical line representing the vertical plane of the optical axis of the camera. The template is laid over the photograph with the vertical and horizontal lines aligned with the center of the photograph and with either the vanishing point of the road or a point at the height of the camera to accurately locate the vehicle in the photograph zone.

3,579,237
METHOD AND APPARATUS FOR AZIMUTH BIAS ERROR CORRECTION OF SEQUENTIAL-OBSERVER DETECTORS
Richard D. Steingart, Dubendorf, Switzerland, and Richard D. Wilmot, Brea, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed June 24, 1969, Ser. No. 836,010
Int. Cl. G01s *9/02*
U.S. Cl. 343—10 **22 Claims**



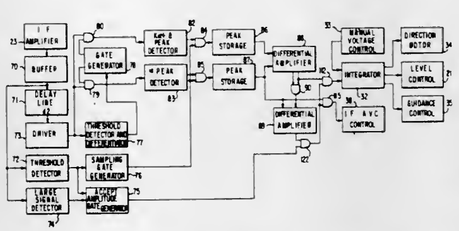
A system is disclosed for the correction of azimuth bias error in sequential-observer detectors for surveillance radar systems which assume an average value of azimuth bias in declaring the leading and trailing edges of a target. After normal beam-splitting, the apparent azimuth of the target is corrected by subtracting the effect of half the sweeps that occurred without a video return while searching for the leading edge. Each such sweep has the effect of delaying declaration of a leading edge by one or two sweeps, depending on the pattern of video returns received.

3,579,238
AUTOMATIC POWER CONTROL OF A PULSE MODULATOR
Andrew V. Haeff, Washington, D.C., and Franklin H. Harris, Accokeek, Md.
Filed Feb. 20, 1971, Ser. No. 649,104
Int. Cl. G01s *7/42;* **H04k** *3/00*
U.S. Cl. 343—18E **7 Claims**



In apparatus receiving periodic radiated pulses and transmitting other periodic radiated pulses responsively to said received pulses and in which the gain of the receiving means in said apparatus is subject to broad variation, means for controlling the output power of the transmitter in said system so that the transmitted pulses fed back through the receiving means do not exceed a selected amplitude, which comprises, a vacuum tube biased so as to be rendered conducting only by the received periodic pulses; a pulse generating means initiated into operation for one pulse only when said vacuum tube is rendered conducting; diode clipping means substantially removing the received periodic pulses from the output of the receiving means and leaving substantially only the portion of the transmitted signal which is fed back through the receiving means; means rectifying the output of the clipping means to form a bias voltage; a variable gain amplifier receiving the output from the pulse generating means, means applying said bias voltage to said variable gain amplifier so as to decrease the gain thereof when the average amplitude of the output of the clipping means increases; rectifier means connected so as to produce a negative direct current potential from an alternating current input; capacitor means coupling the output of the amplifier to the latter rectifier means; a power supply providing a positive and a negative source of potential; a normally conducting cathode loaded vacuum tube having a grid connected across the power supply, the cathode load of said vacuum tube comprising two serially connected resistors, the latter rectifier means being connected so as to operate with reference to the potential of the junction of the two cathode resistors and so that its output is applied to the grid of the cathode loaded vacuum tube; and a vacuum tube having a grid connected in shunt across the power input to the transmitter, the grid of the shunting vacuum tube being connected to the junction of the two cathode resistors.

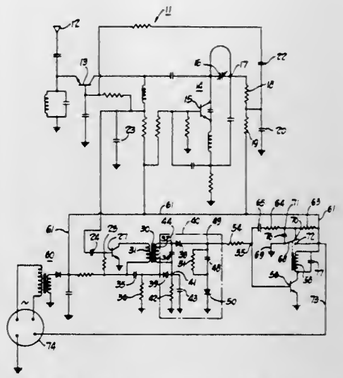
3,579,239
ANGULARLY SELECTIVE MONOPULSE RECEPTION
William O. Purcell, Jr., Maitland, and Walter D. Trippe, Orlando, Fla., assignors to Martin-Marietta Corporation, Middle River (Baltimore County), Md.
Filed July 13, 1965, Ser. No. 471,523
Int. Cl. G01s *9/22*
U.S. Cl. 343—16SD **20 Claims**



This invention relates to an angularly selective monopulse system for receiving desired pulse signals, having means for determining whether an incident pulse was received from within a desired angular range. If not so received, the pulse is rejected, but if it was so received, it is further processed and the information it provides is utilized for appropriately adjusting the center of the acceptance sector. This information may also be used for the physical steering of the vehicle or missile upon which it may be mounted.

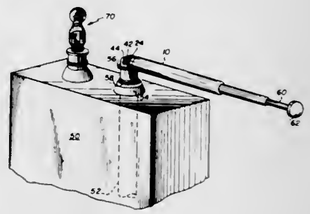
3,579,240
SELECTIVE RADIO RECEIVER SYSTEM
Andrew F. Deming, Alliance, Ohio, assignor to Alliance Manufacturing Company, Inc.
Filed Apr. 30, 1968, Ser. No. 725,294
Int. Cl. H04b *1/00, 1/06, 7/20*
U.S. Cl. 343—228 **21 Claims**

The disclosure shows a remotely controlled radio receiver circuit which may be used to control a garage door operator, for example, from a low-power remote transmitter. The signal emitted by the transmitter includes a carrier as modulated by a lower frequency, for example an audiofrequency, which signal is amplified in the receiver, detected and supplied to an audiofrequency resonant load and to a resistance load. These two loads are connected in opposition so that if the received signal is of the proper carrier frequency to be amplified and passed through the first stages of the receiver and if the audiofrequency is of the proper preselected



frequency to be resonated by the audiofrequency resonant circuit, a resonant voltage signal is passed. A first time delay capacitor is connected in a circuit to give only time delay of turn turn-on of a load relay, and a second time delay capacitor is connected in circuit to give only time delay of dropout of the relay, and in this manner telemetering or other relatively rapid pulsed signals, even of the proper carrier and audiofrequencies, do not actuate the relay. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,579,241
TELESCOPING ROD ANTENNA WITH HINGED JOINT AT A MEDIAL SECTION
Santo M. Antista, Clifton; Milton M Koptula, Denville, and Gerard L. Burggraf, Essex Fells, N.J., assignors to said Antista and said Koptula assignors to Adronics, Inc., Verona, N.J.
Filed Nov. 18, 1968, Ser. No. 776,456
Int. Cl. H01q *1/24, 9/44*
U.S. Cl. 343—702 **5 Claims**

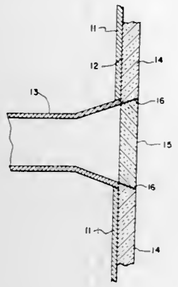


An antenna system including at least one set of telescoping tubes with two adjacent tubes of a set being hinged together to permit a portion of the tubes to assume a horizontal, as well as a vertical, position. The tubes, including the hinge assembly, are all retractable into the tube of largest diameter.

3,579,242
ANTENNA DESIGN FOR SURFACE WAVE SUPPRESSION
William L. Grantham, Yorktown, Va., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Dec. 23, 1969, Ser. No. 887,700
Int. Cl. H01q *1/28, 13/00*
U.S. Cl. 343—708 **6 Claims**

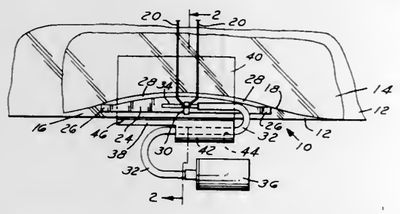
Means for suppressing the excitation of electromagnetic surface waves on a dielectric converter antenna. A hole is cut

in the dielectric where it covers the antenna. A plug of the dielectric material is coated around its rim with a metal and



then fitted into the hole such that the metal coating extends the conducting surface of the antenna through the dielectric material. The metallic coating minimizes the possibility of surface wave excitation by confining the waves reflected by the dielectric-air interface to the chamber formed by the coating.

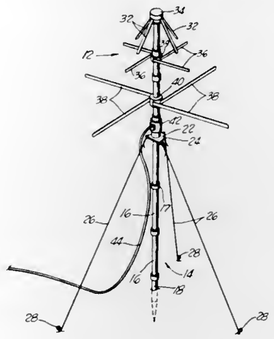
3,579,243
WINDSHIELD ANTENNA SYSTEM
Richard T. Dickason, Birmingham, and John A. Richardson, Harper Woods, Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Aug. 11, 1969, Ser. No. 848,799
Int. Cl. H01q *1/32*
U.S. Cl. 343—713 **8 Claims**



An improved windshield antenna system is described in which a pair of laminated glass sheets forming the windshield contains a pair of antenna wires adhered to the laminating interlayer. The wires have free ends which extend out beyond a cutout portion formed in one of the glass sheets. The free ends of the wires are terminated to an attaching area of a conductive terminal which terminal is received in the cutout portion of the glass sheet. An electrical lead is also connected to the conductive terminal at the attaching area. A nonconductive tab is affixed to one surface of the glass sheet away from the cutout portion of the one glass sheet. The tab holds the electrical lead in a relatively stable position with respect to the attaching area of the conductive terminal at which the lead is terminated to the antenna wires. A potting compound overlies the region of the termination of the antenna wires and the electrical lead to the attaching area of the conductive terminal.

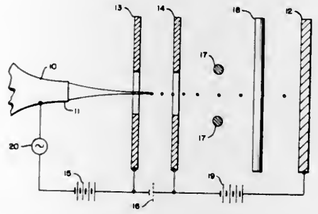
3,579,244
COLLAPSIBLE ANTENNA EMPLOYING FLEXIBLE TAPE RADIATORS
Richard C. Dempsey, Chatsworth, and Francis E. Lind, Granada Hills, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Aug. 27, 1968, Ser. No. 755,563
Int. Cl. H01q *21/26, 15/20*
U.S. Cl. 343—797 **5 Claims**

A plurality of radiating elements fabricated of flexible thin steel is secured to a telescoping mast. A ground plane is formed of a plurality of similar steel members which are mounted in a plane perpendicular to the mast. Within the



mast are cables and auxiliary electrical equipment. The radiating elements, the ground plane elements, and the mast are completely collapsible into a compact package.

3,579,245
METHOD OF TRANSFERRING LIQUID
James M. Berry, Princeton, N.J., assignor to Teletype Corporation, Skokie, Ill.
Filed Dec. 7, 1967, Ser. No. 688,947
Int. Cl. G01d *15/18*
U.S. Cl. 346—1 **9 Claims**

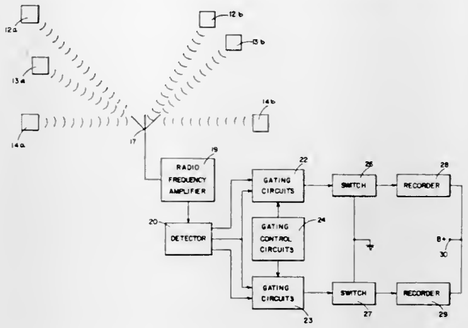


An electrostatic printer has a nozzle from which the ink is issued with an accelerating electrode and an intermediate electrode placed between the nozzle and the platen or target. A high voltage potential difference is established between the nozzle and the target with an intermediate potential being applied to the accelerating and intermediate electrodes. A sufficient potential difference exists between the nozzle and the accelerating electrode to draw the ink from the nozzle into a fine stream, and a sinusoidally varying field is superimposed on the field between the nozzle and the accelerating electrode to establish a high frequency vibration in the electrostatically charged ink stream. Droplet formation then takes place in synchronism with the sinusoidally varying field in a region of a weak field between the accelerating and intermediate electrodes which are at the same or only slightly different potentials, with the size and spacing of the droplets being controlled by the frequency of the sinusoidally varying field. As a result, droplets of substantially uniform size, substantially uniformly spaced apart, are formed.

3,579,246
TIME SHARING RECORDER DRIVE CIRCUIT
Theodore Lauer Rhyne, Summit, N.J., and Karl F. McCready, San Pedro, Calif., assignors to Northrop Corporation, Beverly Hills, Calif.
Filed Mar. 4, 1969, Ser. No. 804,079
Int. Cl. G01d *9/00*
U.S. Cl. 346—34 **4 Claims**

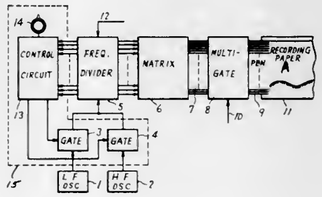
Navigational signals having pulse widths in accordance with navigational lines of position are fed to logical gating

circuitry, including a pair of AND gates and an OR gate, the outputs of the AND gates being fed to an OR gate. The AND



gates are alternately gated ON by means of a flip-flop, the OR gate output thus alternately including the signals fed to each of the AND gates. The output of the OR gate is utilized to control a switching circuit which controls the current to the magnetic drive coil of a chart recorder, the writing element of the recorder being successively deflected to positions indicative of the signals fed to each AND gate in accordance with the average current in the drive coil.

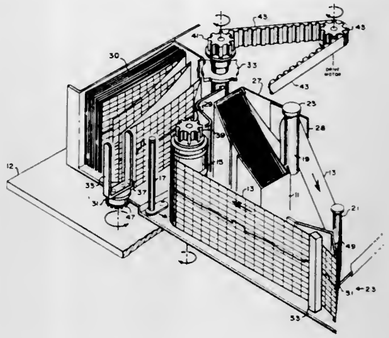
3,579,247
MULTISTYLUS PEN RECORDING SYSTEM
Kiyomi Minohara; Hiroshi Ishida, Nishinomiya; Tomoyoshi Miyata; Takeyoshi Takashima, Kobe, and Yoichi Umehara, Nishinomiya, Japan, assignors to Furuno Electric Company, Ltd., Minamitakaki-gu, Nagasakiken, Japan
Filed July 14, 1969, Ser. No. 841,437
Claims priority, application Japan, July 15, 1968, Dec. 5, 1968, 43/50142;43/89453
Int. Cl. G01d *5/247;* **G01s** *7/60*
U.S. Cl. 346—35 **7 Claims**



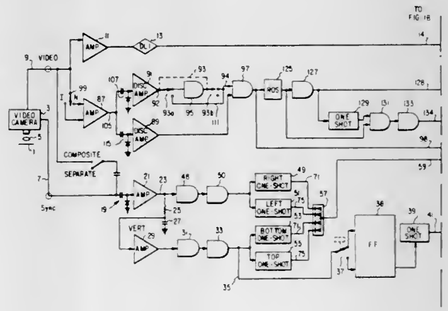
A multistylus pen recording system having a plurality of styli arranged transversely of and in contact with recording paper, means for generating a series of signal pulses which are applied in sequence to the styli for recording said pulses and means for producing a selectively variable high frequency signal to control the spacing of said pulses and thereby effect a variation in the magnification of the pattern recorded on the paper.

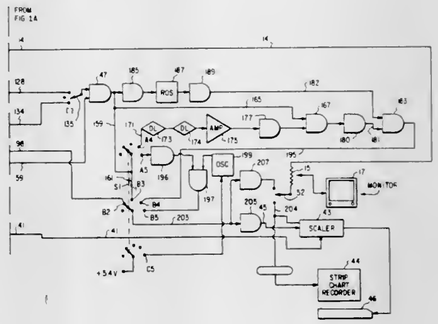
3,579,248
HORIZONTAL Z-FOLD RECORDER
Walter R. McGrath, Jr., Gloucester, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed June 11, 1969, Ser. No. 832,241
Int. Cl. G01d *15/30*
U.S. Cl. 346—76 **12 Claims**

A strip chart recording mechanism unfolds Z-folded paper from a supply stack and guides the paper past a recording station. The paper is then refolded and stacked in a Z manner. The mechanism operates to feed the paper horizontally with respect to a ground plane. The recording station includes two knife edges for engaging opposite surfaces of the paper. One knife edge serves as a recording platen in conjunction with a writing stylus, and the other knife edge counteracts the effect of the first knife edge on the Z-fold creases in the paper.



3,579,249
FEATURE COUNTER HAVING BETWEEN LIMITS AMPLITUDE AND/OR WIDTH DISCRIMINATION
Raymond D. Dewey, Bon Air; Robert S. Mapes, and Garth S. Jones, Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.
Continuation-in-part of application Ser. No. 767,614, Oct. 15, 1968. This application Aug. 8, 1969, Ser. No. 848,474
Int. Cl. G01n *15/02;* **H04n** *7/18*
U.S. Cl. 178—6 **16 Claims**

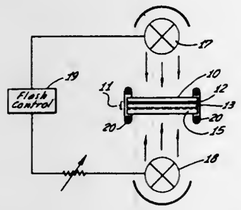




A specimen analyzer including a video camera for scanning a specimen and selectively counting features

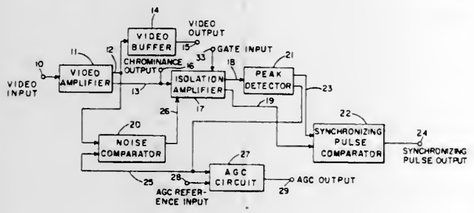
thereof on the basis of grey level and size. The device may operate in several modes to count only features darker (or lighter) than a selected grey level, to count only features that are darker than a first grey level but lighter than a second grey level, to count only features wider than a selected width, to count only features wider than a first width but not as wide as a second width, or to count features that meet more than one of these tests. A variable electronic mask permits the operator to select any area of the specimen within the view of the camera for feature analysis without moving the specimen. Check spot pulses are generated for each feature counted and these may be displayed on a video motor superimposed on a video display of the specimen.

3,579,250
PRODUCTION OF LATENT IMAGES BY CURIE POINT RECORDING
Alfred M. Nelson, Redondo Beach, Calif., assignor to The Magnavox Company, Torrance, Calif.
Filed Jan. 5, 1967, Ser. No. 607,521
Int. Cl. H04n *5/76;* **G03g** *19/00*
U.S. Cl. 178—6.6 **16 Claims**



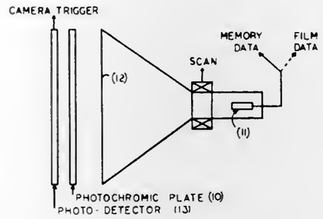
A latent magnetic image, positive or negative, is provided on a low Curie point storage carrier by providing concurrently radiation for a line raster and for pictorial information. Depending on the chosen intensity of the thermal radiation energy bias and information, the image will be positive or negative. The image is represented by a series of magnetic pole lines of alternating polarity and variable spacing.

3,579,251
VIDEO SIGNALLING PROCESSING APPARATUS WITH NOISE PROTECTION
Ralph E. Lovelace, North Reading, Mass., assignor to Sylvania Electric Products Inc.
Filed June 24, 1968, Ser. No. 739,323
Int. Cl. H04n *3/16*
U.S. Cl. 178—7.3 **13 Claims**



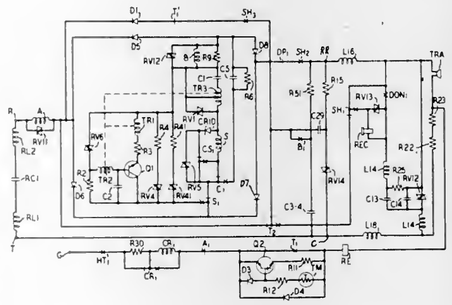
Video signal-processing apparatus which amplifies the composite video signal from the video detector of a television receiver and charges a capacitance to the peak voltage of the synchronizing pulses. The composite video signal is compared with the voltage stored in the capacitance by a comparator and an output pulse is produced when the voltage of the composite video signal is high enough to indicate the presence of a synchronizing pulse. The composite video signal is also compared with the stored voltage by a second comparator, and a noise-cancelling signal which prevents noise from affecting the voltage stored on the capacitance or the first comparator is generated when the voltage of the composite video signal is high enough to indicate the presence of noise.

3,579,252
COMPUTER DRIVEN DISPLAYS EMPLOYING PATTERN RECOGNITION TECHNIQUES
David M. Goodman, 3843 Debra Court, Seaford, N.Y.
Filed Sept. 30, 1965, Ser. No. 491,673
Int. Cl. H04n *5/72*
U.S. Cl. 178—7.85 **18 Claims**



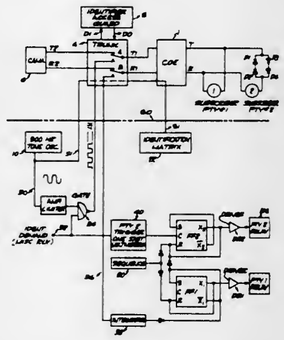
Different displays are generated on the face of a color cathode ray tube to provide easy-to-interpret patterns representative of input data. The display may be analyzed by human observers, or by automatic means. The patterns are matrixlike in format. Analogue input data is quantized so that the position and/or color of points in the matrix represent a comparison of the input data to reference data. For testing purposes, the data is quantized into five levels and a different color is assigned to each level. Digital input data is transformed into color bits for visually testing the memory bank of a computer. Test data which varies in time is superimposed on data of fixed format to provide a "Blink" effect when the two sets of data do not match. Parity detectors are used to trigger a camera unit which takes photographs of the display screen when mismatch or out-of-tolerance conditions are detected. One such detector consists of an in-line of assembly of display screen, photochromic screen, and plastic scintillator.

3,579,253
COIN TELEPHONE CIRCUIT FOR DIAL-TONE-FIRST SERVICE
John E. Edington, and Merville L. Warnock, Indianapolis, Ind., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Nov. 8, 1968, Ser. No. 774,376
Int. Cl. H04m *17/02*
U.S. Cl. 179—6.3 **11 Claims**



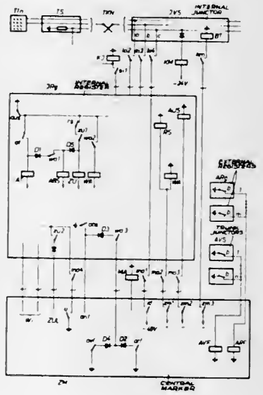
A conventional coin telephone circuit is modified for dial-tone-first service (limited service without a coin deposit) by various interrelated circuit changes which also provide additional features including a shift from an initial rate mode to a subsequent deposit mode in response to battery reversal and a means for indicating that an adjustable initial rate deposit or an overtime deposit has been made.

3,579,254
CALLING SUBSCRIBER PARTY LINE IDENTIFICATION CIRCUIT
Doyle V. Carmody, and John S. Welch, Milan, Tenn., assignors to International Telephone and Telegraph Corporation
Filed Oct. 30, 1967, Ser. No. 678,804
Int. Cl. H04m *13/00*
U.S. Cl. 179—17 **1 Claim**



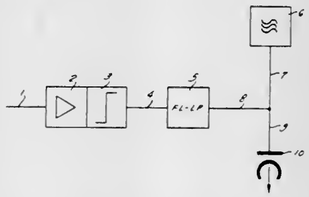
One party on a two-party line is connected in series with a diode circuit across the tip and ring lines. The diodes have a breakdown voltage above the level of AC tone from a central office and the tone does not pass through. The other party is connected directly across the tip and ring lines and AC tone transmitted to it when the hookswitch is "off" is transmitted through to a control circuit. The control circuit senses the presence or lack of tone and provides appropriate control signals which can be used to supply or control an indication of which is the calling party to the toll center.

3,579,255
OUTGOING TRUNK CONNECTION FOR PABX
Walter Kaiser, Mohrenacker, Germany, assignor to International Standard Electric Corporation, New York, N.Y.
Filed June 18, 1968, Ser. No. 737,925
Claims priority, application Germany, July 14, 1967, ST27136
Int. Cl. H04q *3/42*
U.S. Cl. 179—18 **1 Claim**



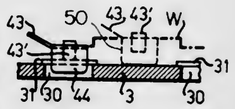
A central marker, connected to a PABX, supervises the busy condition of trunk junctors and external registers. If, in an internal register, a call for a trunk line has been detected and all the external registers are busy, but at least one trunk junctor is available, the marker restores the time control of the internal register. As soon thereafter as an external register becomes available, the marker is requested again and the trunk connection is initiated.

3,579,256
COMBINATION SUBCARRIER FILTER AND BIAS TRAP FOR MAGNETIC TAPE RECORDERS
Gerd Cyrener, and Joachim Fahrendholz, Frankfurt-Main-Seckbach, Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Main, Germany
Filed July 1, 1968, Ser. No. 741,797
Claims priority, application Germany, June 30, 1967, B93256
Int. Cl. G11b *5/00*
U.S. Cl. 179—100.2 **4 Claims**



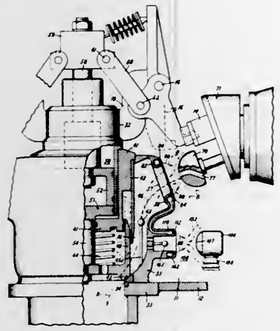
A recording amplifier receives audio frequency signals having additional undesired high frequency noise and furnishes corresponding amplified signals at a recording output. These are filtered by a low pass filter which passes the audio signals but rejects the high frequency noise. The output of the filter is directly connected to a premagnetization oscillator output and the recording head. Thus it also serves to decouple the premagnetization oscillator output from the recording amplifier, while permitting the full premagnetization oscillator output to be transmitted to the recording head.

3,579,257
MULTIPOSITIONAL SWITCH CONSTRUCTION
Helmuth Spreitzer, Zurich, Switzerland, assignor to Contraves AG, Zurich, Switzerland
Filed Apr. 15, 1969, Ser. No. 816,257
Claims priority, application Switzerland, May 13, 1968, 7085/68
Int. Cl. H01h *19/58, 21/78, 3/00*
U.S. Cl. 200—11 **7 Claims**



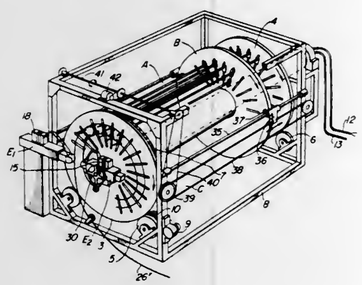
There is disclosed a multipositional switch comprising a rotatably mounted switching wheel equipped with a rotary wiper switch means possessing at least two contact fingers. A circuit board having a plurality of contact tracks, for instance in the form of a number of contact segments and one ring-shaped contact member, cooperate with the rotary wiper switch means such that for each selected position of the switching wheel at least two of the contact tracks are electrically coupled with one another via the contact fingers. The circuit board possesses a plurality of spaced recesses, and cam means are provided for at least one of the contact fingers. The cam means for each switching position of the switching wheel being located in an associated one of said recesses. Upon rotation of said switching wheel into its next switching position, the cam means move out of the associated one recess and along the surface of the circuit board, to thereby rapidly raise the contact finger provided with such cam means from its associated contact track located at the circuit board.

3,579,258
GAS BLAST CIRCUIT BREAKER USING A GENERALLY AXIAL FLOW MAIN BLAST
John W. Beatty, Newtown Square, Pa., assignor to General Electric Company
Filed Sept. 23, 1968, Ser. No. 761,674
Int. Cl. H01h *33/70*
U.S. Cl. 200—148 **5 Claims**



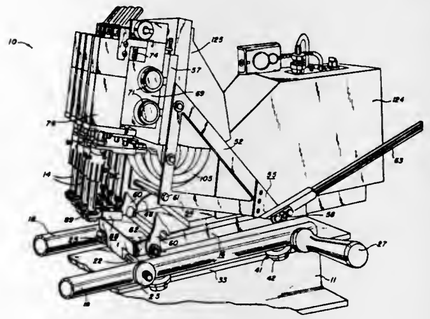
Discloses a gas-blast circuit breaker comprising an upstream electrode, a downstream electrode spaced therefrom, and an orifice having an opening positioned between said electrodes. During interruption, an arc established between the electrodes extends through the orifice opening, and a gas blast is caused to flow through the orifice opening via paths extending along the external surface of the upstream electrode and generally axially of the arc adjacent the upstream electrode. Improved flow conditions adjacent the upstream electrode are produced by providing a series of jets issuing from circumferentially-spaced points about the orifice opening and directed convergently toward the central region of the downstream face of the upstream electrode.

3,579,259
APPARATUS FOR MAKING A DOUBLE-LAYER REINFORCING CAGE FOR CONCRETE PIPES
Shigeru Kato, Koza-gun, Japan, assignor to Nippon Rocla Pipes Co., Ltd., Tokyo, Japan
Filed June 23, 1969, Ser. No. 835,681
Int. Cl. B23k *11/00;* **B21f** *15/08*
U.S. Cl. 219—56 **4 Claims**



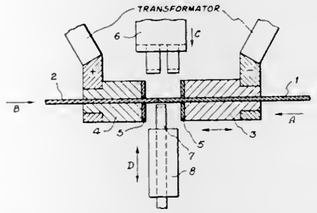
An apparatus is provided for making a double-layer reinforcing cage for concrete pipes which permits welding of longitudinally oriented steel bars and circumferentially oriented steel bars of an outer reinforcing cage member and simultaneously and respectively the longitudinally oriented steel bars and circumferentially oriented steel bars of an inner reinforcing cage member. The apparatus comprises a rotor and a feed plate for moving the longitudinally oriented steel bars rotatably mounted on a hollow stationary pipe, and two sets of longitudinally oriented steel rod guide lines for the outer reinforcing cage member and the inner reinforcing cage member respectively are mounted in the periphery of the rotor in such a manner that the two sets of guide lines are spaced apart from each other a predetermined distance, radially of the rotor. A welder for the inner reinforcing cage member and means for supplying circumferentially oriented steel bars to the inner reinforcing cage member are mounted at one end of said hollow stationary pipe.

3,579,260
MACHINE FOR WELDING STUDS TO BEAMS
Lewis J. Logan, 11820 Edgewater Drive, Lakewood, 7, Ohio
Continuation-in-part of application Ser. No. 223,457, Sept. 13, 1962, now abandoned. This application July 28, 1965, Ser. No. 477,652
Int. Cl. B23k *9/20*
U.S. Cl. 219—98 **8 Claims**



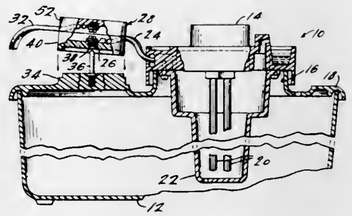
A welding machine for simultaneously welding a plurality of studs on a beam (particularly an I-beam) comprising a frame with front and rear wheels for engaging the beam. A plurality of welding heads are mounted on a supporting means and each head includes a chuck for holding a stud; means for moving the chuck away from the beam; means for moving the chuck toward the beam; and, means for supplying electric power to the chuck. The heads are mounted for vertical and horizontal adjustment relative to the frame. Guide means are provided between the machine and the beam to properly orient the machine relative thereto and means are provided for raising and lowering said heads and supporting means as a unit relative to the wheels of the machine.

3,579,261
MAKING OF RIVET HEAD BIMETALLIC ELECTRICAL CONTACTS
Hans Wacker, Heidelberg, Germany, assignor to Renz Wacker & Co., Maschinen-u Kettenfabrik
Filed Oct. 14, 1968, Ser. No. 767,321
Claims priority, application Germany, Oct. 12, 1967, P 16 26 696.3
Int. Cl. B21j *5/06;* **H05b** *1/00*
U.S. Cl. 219—154 **7 Claims**



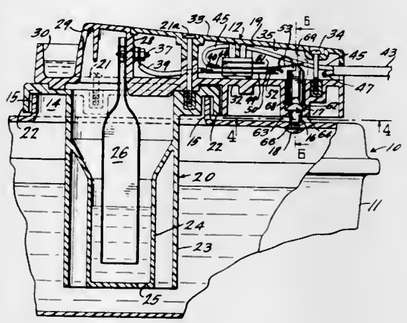
A rivet head is formed on a bimetallic electrical contact wire by striking one end of the wire with flat surfaced cam means while retarding the advance of the wire by spring-loaded cam means.

3,579,262
ELECTRIC STEAM VAPORIZER
Donald J. Peeps, Rossford, Ohio, assignor to Champion Spark Plug Company, Toledo, Ohio
Filed May 22, 1968, Ser. No. 731,124
Int. Cl. H05b *3/60*
U.S. Cl. 219—295 **4 Claims**



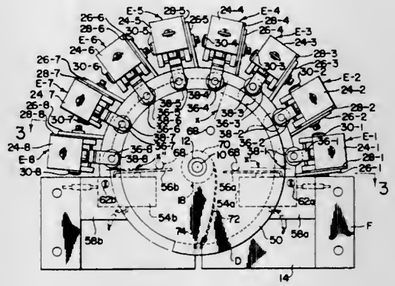
A safety device for a steam vaporizer having a liquid reservoir base with a removable top. A pair of electrodes depend from the top into the reservoir base for heating a liquid. To remove the top from the base, spaced terminals provided in a terminal block must be disengaged from shorting conductors on the base reservoir, thereby opening the power circuit to the electrodes, In one embodiment, the terminal block is an integral part of the top. In another embodiment, the block is secured to the top by connector cord of such length that the block terminals must be disengaged from the shorting conductors in order to remove the top with its dependent electrodes from the base.

3,579,263
ELECTRIC STEAM VAPORIZER
William H. Corbett; Albert D. Brunell, and George M. Koharchik, Somerset, Pa., assignors to The DeVilbiss Company and Champion Spark Plug Company, Toledo, Ohio
Filed Nov. 25, 1968, Ser. No. 778,685
Int. Cl. H05b *3/60*
U.S. Cl. 219—295 **9 Claims**



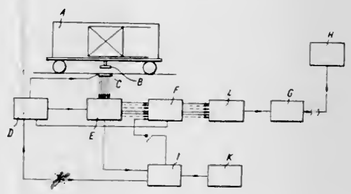
An electric steam vaporizer having a liquid reservoir and a removable top. A post member is mounted on the upper part of the liquid reservoir. The top has an opening in one side which receives the post member when the top is placed on the reservoir. The post member actuates a switch which closes an electrical circuit to the vaporizer electrodes. The post also mechanically locks the top to the reservoir thus minimizing possible heated water injuries in the event of vaporizer overturning.

3,579,264
REVERSIBLE PROGRAMMER FOR ELECTRIC CIRCUITS
George B. Mork, Baraboo, Wis., and Donald J. Morse, Davenport, Iowa, assignors to Gulf & Western Industries, New York, N.Y.
Filed Oct. 24, 1968, Ser. No. 770,332
Int. Cl. H05b *1/02*
U.S. Cl. 219—486 **8 Claims**



An improved reversible programmer having a regulated control sequence in both a forward and reverse direction. The programmer includes a plurality of actuatable control switches and a generally arcuate rotatable cam for sequentially actuating the control switches. A thermally controlled motor means is provided to drive the cam in a forward direction thereby actuating the control switches to energize electrical circuits, or to drive the cam in a reverse direction whereby the control switches are disengaged and the circuit deenergized. A pair of limit switch means are employed for deenergizing the motor means when the cam reaches a specific location. In addition, a clutch means is used to drivingly connect the cam to the motor means.

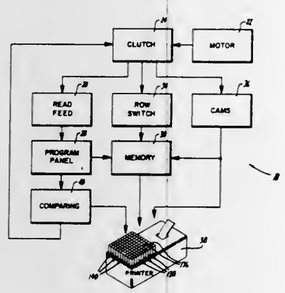
3,579,265
METHOD AND APPARATUS FOR TRANSMITTING INFORMATION
Jozsef Mandzsu, and Erno Csaszar, Budapest, Hungary, assignors to Fok-Gyem Finommechanikai Es Elektronikus Muszergyarto, Budapest, Hungary
Filed May 10, 1968, Ser. No. 728,183
Claims priority, application Hungary, May 10, 1967, Ma-1711
Int. Cl. G06k *7/08;* **B61l** *27/04*
U.S. Cl. 235—61.11 **9 Claims**



Method and apparatus for transmitting information between a track bound vehicle and a point on the track whereby the desired information is provided independent of the speed and direction of the travelling vehicle. The signal transmitter is coded according to the desired information, for example, the identifying number of the vehicle, by the selective positioning of a plurality of magnets within a matrix of positions, while the receiver is provided with a plurality of magnetically operated switches, for example, Reed-switches, one for each possible position of the magnet. The transmitter is also provided with an additional gate magnet which is positioned so that it can cooperate with one of a pair of additional magnetic switches provided in the receiver depending

on the direction of travel of the vehicle. Actuation of either of these additional magnetic switches causes signals to be simultaneously emitted in parallel from each of the other magnetic switches closed in accordance with the transmitted coded signal. The output signals from the closed magnetic switches are fed to a code converter which, depending on which one of the additional magnetic switches was actuated, provides a binary coded output signal which either represents the actual detected numerical value or its compliment. The coded output signals are then either placed in an intermediate store and subsequently read or recorded, for example, by perforating a tape, or are directly recorded.

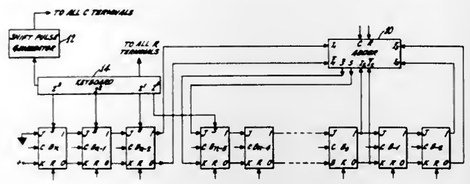
3,579,266
AUTOMATIC ADDING MACHINE
James E. Berardy, Daly City, and David A. Weinstein, Berkeley, Calif., assignors to Rollin J. Lobaugh, Inc.
Filed May 6, 1968, Ser. No. 726,772
Int. Cl. G06k *15/02;* **H04q** *1/00*
U.S. Cl. 235—61.6 **33 Claims**



An automatic adding machine for reading, accumulating, and printing data from media such as punched tape and cards, magnetic tape and the like. A read and feed mechanism sequentially decodes the data from the media and transmits data responsive signals to a matrix where all data from a set of data such as a punched card is stored. An adding machine or like accumulation device is coupled with the matrix sand has a plurality of electrically actuated digit keys. The matrix includes a memory cell for each digit key. Electric command circuits are responsive to data decoded by the read and feed mechanism, are synchronized therewith and include a second memory system which permits storage of command signals from the read and feed mechanism so that the command data can be read prior to the reading of the data stored in the matrix. Upon completion of the reading of the set of data, one of the command circuits is energized to select the operating mode of the adding machine such as the add, subtract, etc. mode. At the same time, data stored in the matrix is fed into the adding machine whereby the data is accumulated therein and printed out. To prevent loss of data due to an asynchronism between the adding machine operating cycle and the operating cycle of the read-feed mechanism the duration of the former is shorter than that of the latter while the commencement of both cycles is interdependent.

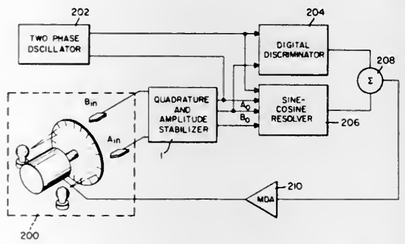
3,579,267
DECIMAL TO BINARY CONVERSION
Carl Macey Wright, Cinnaminson, N.J., assignor to RCA Corporation
Filed Sept. 24, 1969, Ser. No. 860,592
Int. Cl. H03k *13/24*
U.S. Cl. 235—155 **4 Claims**

Successive 4-bit numbers representing successive decimal digits in decreasing order of significance are inserted into one portion of a register means. During each period between the insertion of one 4-bit number and the next, the bits are shifted stage-to-stage and an adder serially adds the bit stored in one stage of said one portion of the register means to bits stored in two other stages of the register means. The selection of stages is such as to cause to be added to each new decimal digit, the two multiple and the eight multiple of a binary number representing all previously applied decimal digits. The successive sum bits produced by the adder are



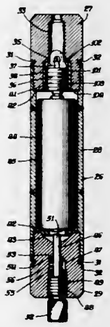
returned, in serial fashion, to the register means and represent a new binary number equal to the digits inserted, to that point, of the decimal number.

3,579,268
AUTOMATIC QUADRATURE AND AMPLITUDE STABILIZER
Richard J. Steiger, Berkeley, Calif., assignor to Ampex Corporation, Redwood City, Calif.
Filed July 9, 1968, Ser. No. 743,555
Int. Cl. G06g *7/22*
U.S. Cl. 235—189 **5 Claims**



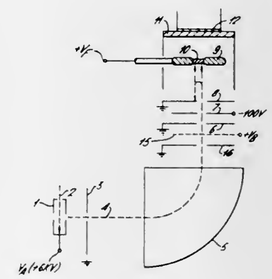
A network adapted to receive two phase related signals and generate two responsive quadrature related signals. One received signal serves as a reference. A servocontrolled percentage of the reference signal is mixed with the other received signal to form a resultant third signal which is quadrature relative to the reference signal.

3,579,269
AUTOCLAVABLE POWER-PAK SEAL
Ralph G. Ostensen, Morton Grove, Ill., assignor to Medical Products Corp., Skokie, Ill.
Filed Nov. 22, 1968, Ser. No. 778,288
Int. Cl. F21l *7/00;* **A61b** *1/06*
U.S. Cl. 240—10.68 **9 Claims**



Autoclavable power-pak having a bore in a stainless steel casing housing a lens-end light bulb with an externally threaded base, a heat and pressure resistant silicone rubber seal comprising a tubular body surrounding the bulb and an integral annular flange extending inwardly from its upper end for resilient engagement with the lens end of the bulb to effect a sealing action, and a brass sleeve threadedly mounted on the base of the bulb to effect a sealing action, and a brass sleeve threadedly mounted on the base of the bulb and having a lower outwardly extending flange engaging the case for electric current transfer purposes and the lower end of the tubular body to effect a second sealing action between the bulb and the casing.

3,579,270
ENERGY SELECTIVE ION BEAM INTENSITY MEASURING APPARATUS AND METHOD UTILIZING A SCINTILLATOR TO DETECT ELECTRONS GENERATED BY THE BEAM
Norman Richard Daly, Reading, and Royal Edward Powell, Newbury, England, assignors to United Kingdom Atomic Energy Authority, London, England
Filed Oct. 22, 1968, Ser. No. 769,644
Claims priority, application Great Britain, Oct. 31, 1967, 49529/67
Int. Cl. G01t *1/20;* **B01d** *59/44*
U.S. Cl. 250—41.9 **13 Claims**

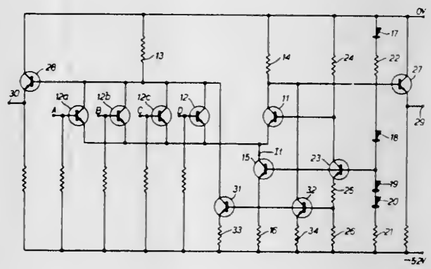


The apparatus is primarily intended for use with ion beams from mass spectrometers, and has one application in determining metastable ion spectra. It comprises a retarding electrode carrying a scintillator detector and preceded by an apertured electrode. When the retarding electrode voltage equals or exceeds the source accelerating voltage, all ions are repelled to the apertured electrode where secondary electrons are produced which are accelerated to the scintillator and an output is obtained from a photomultiplier located beyond the retarding electrode. When the retarding electrode voltage is less than the source accelerating voltage only ions resulting from metastable fragmentations (which have less energy) are so repelled. The parent ions strike the scintillator but produce no output because the latter is coated with an ion-opaque layer. A second, apertured, retarding electrode can precede the above-described arrangement, to which a lower voltage is applied, thus setting a lower as well as an upper limit to the ion energy detected and making the apparatus of more general application as an energy range selector.

3,579,271
METHOD OF MEASURING COATING WEIGHT BY USING STRONTIUM AS A TRACER
Marc Paul Pomerantz, Old Bridge, N.J., assignor to E.I. du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 18, 1968, Ser. No. 714,090
Int. Cl. G01n *23/22*
U.S. Cl. 250—51.5 **6 Claims**

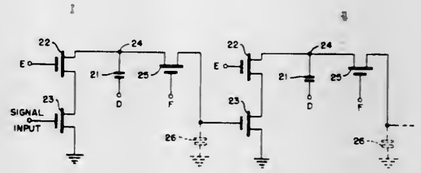
A process of measuring the dry coating weight of a gelatin coating by adding a given amount of strontium to the coating solution before coating, then analyzing the dried coating to determine the amount of strontium present, thereby, indicating the coating weight.

3,579,272
LOGIC CIRCUITS
Richard Charles Foss, Ilford, Essex, England, assignor to The Plessey Company Limited, Essex, England
Filed Feb. 12, 1969, Ser. No. 798,714
Claims priority, application Great Britain, Feb. 16, 1968, 7833/68
Int. Cl. H03k *19/20, 1/12*
U.S. Cl. 307—218 **6 Claims**



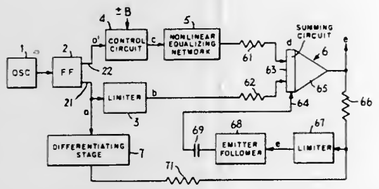
An emitter coupled logic circuit comprises a long-tailed pair switch defined by transistors connected respectively to output transistors in emitter follower configuration. A V_{BE} variation with temperature of said output transistors being compensated for by further transistors whose bases are provided with a constant voltage supply.

3,579,273
DYNAMIC SHIFT REGISTER
Harold D. Cook, Wheaton, Ill., assignor to Teletype Corporation, Skokie, Ill.
Filed Oct. 1, 1968, Ser. No. 764,247
Int. Cl. G11c *19/00*
U.S. Cl. 307—221 **6 Claims**



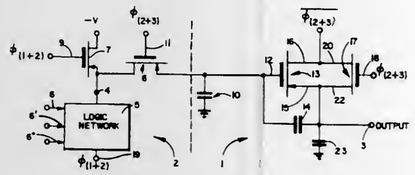
A dynamic integrated circuit MOS shift register includes a first storage capacitor which is charged by a first clock signal to a predetermined voltage. This first capacitor then is discharged or remains charged corresponding to an input signal applied to a shunting MOS insulated-gate field-effect transistor connected in series with a control MOS insulated-gate field-effect transistor having a second clock signal applied to it. The control transistor is rendered conductive by the clock signal and the shunting transistor is rendered conductive by an input signal of one type and remains nonconductive for an input signal of a second type. Thus, the capacitor is discharged only when an input signal of said one type occurs. Following the application of the input signal, a transfer MOS insulated-gate field-effect transistor is rendered conductive by the application of a third clock pulse to transfer the charge on the storage capacitor to the distributed gate-to-substrate capacitance present at the gate of the shunting transistor for the next stage. The charge on the distributed capacitance then constitutes the input for the next stage of the shift register and the cycle is repeated.

3,579,274
GENERATOR FOR PRODUCING TRIANGULAR SIGNALS
Arne Jensen, Havnbjerg, Als, and Tom Kastrup Petersen, Nordborg, Denmark, assignors to Danfoss A/S, Nordorg, Denmark
Filed Aug. 26, 1968, Ser. No. 755,299
Claims priority, application Germany, Aug. 29, 1967, D53955
Int. Cl. H03k *4/06*
U.S. Cl. 307—228 9 Claims



A wave generator having an oscillator and a flip-flop generating two square waves of constant frequency and one of which is varied in amplitude in dependence upon the varying amplitude of a control signal received in a control circuit and the other of which is limited in amplitude by a limiter. The two square waves are applied to and added in a summing circuit and integrated in a differentiating amplifier with a limiter and emitter follower feedback circuit.

3,579,275
ISOLATION CIRCUIT FOR GATING DEVICES
Robert W. Polkinghorn, Huntington Beach; Arthur F. Pfeifer, Whittier; Robert F. Hartmann, Santa Ana, and Robert D. Schull, Mission Viejo, Calif., assignors to North American Rockwell Corporation
Filed Jan. 7, 1969, Ser. No. 789,441
Int. Cl. H03k *17/60, 17/60*
U.S. Cl. 307—251 7 Claims



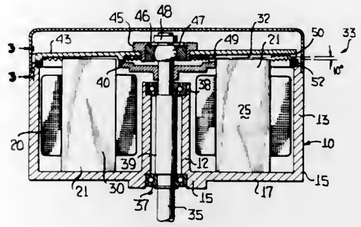
Capacitors are charged during a first recurring interval of time to turn a MOS device on for connecting an output terminal to ground. The MOS devices comprise part of a buffer or isolating circuit which is interposed between a multiphase gating circuit and the output terminal. During a second recurring interval, the capacitors are conditionally discharged as a function of inputs to the multiphase gating device.

If the capacitors were discharged during the second interval the output remains at ground during a third interval. However, if the capacitors were not discharged, the output is driven to a voltage level from a clock source. The change in the voltage at the output terminal is fed back through one of the capacitors to the gate electrode of the MOS device for driving the output to approximately the voltage level of the clock source.

Since the MOS device is turned on completely, any positive noise on the output of the circuit is neutralized by the current through the MOS device.

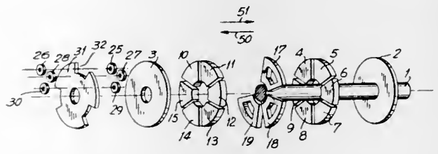
A second MOS device may be connected in parallel with the first device to permit the capacitor to be completely discharged to ground during the second interval.

3,579,276
HARMONIC DRIVE FOR DIGITAL STEP MOTOR
Harold R. Newell, South Newbury, N.H., assignor to Mesur-Matic Electronics Corporation, Warner, N.H.
Filed Mar. 31, 1967, Ser. No. 627,410
Int. Cl. H02k *7/06*
U.S. Cl. 310—82 7 Claims



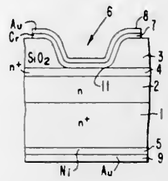
A step motor has first and second circular coaxial gears mounted on a rotor disc for pivoting and rotation relative to a shaft extending through the disc. Third and fourth circular coaxial gears are arranged to mesh with respective ones of the first and second gears but are normally separated along the shaft from the first and second gears so that meshing can occur only in a limited common sector of the gears upon tilting of the disc on the shaft. The third gear is fastened irrotationally relative to the axis and the fourth gear is fastened to the shaft. The disc comprises electromagnetic material and is subjected to an electromagnetic field that rotates about the shaft, in response to sequential energization of electromagnetic actuators disposed in a circular array about the shaft, to produce wobble motion of the disc about the shaft. At least one pair of meshing gears have different numbers of teeth so that wobble of the disc is accompanied by rotation of the fourth gear, and hence, of the shaft, about the axis.

3,579,277
BRUSHLESS DIRECT CURRENT MOTOR
Issei Imahashi, Suwa-shi, Japan, assignor to Kabushiki Kaisha Suwa Seikosha
Filed Apr. 29, 1969, Ser. No. 820,200
Claims priority, application Japan, Apr. 30, 1968, 43/28687
Int. Cl. H02k *21/00*
U.S. Cl. 310—156 5 Claims



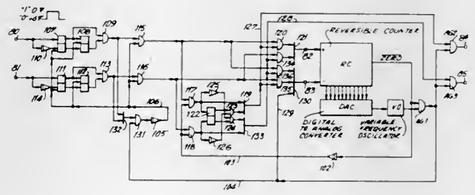
In brushless direct current motors having pairs of axially spaced permanent magnets radially arranged about and fixed to a rotor shaft, driving coils disposed in the space between said pairs of permanent magnets and detecting means including detecting coils, and a shield ring having cutaway portions in the path of said detecting coil for the operation of each detecting coil when said cutaway portions are aligned therewith for the activation of the driving coil associated with said detecting coil; the improvement of mounting the driving coils in apertures in an insulated board at an angular interval of about 100° and forming said board with a notch extending from the edge thereof to the center of said driving coils to permit removal of said rotor shaft.

3,579,278
SURFACE BARRIER DIODE HAVING A HYPERSENSITIVE η+ REGION FORMING A HYPERSENSITIVE VOLTAGE VARIABLE CAPACITOR
John Heer, West Newbury, Mass., assignor to Varian Associates, Palo Alto, Calif.
Filed Oct. 12, 1967, Ser. No. 674,821
Int. Cl. H01l *3/00*
U.S. Cl. 317—234 3 Claims



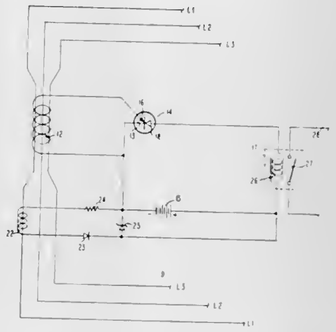
A surface barrier diode, also known as a Schottky diode, is disclosed having a hypersensitive voltage variable capacitance. The surface barrier diode structure comprises a silicon wafer of n^+ conductivity having an N-type epitaxial layer which is oxidized on its outer surface to form a silicon oxide layer overlaying the epitaxial n-region of the wafer. The silicon oxide coating is relatively thin, as of less than 5000 A., and is formed relatively quickly i.e., in less than 20 minutes at a temperature within the range of 1150° C. to 1250° C. in order to produce a hypersensitive n^+ impurity accumulation layer immediately adjacent to and underlying the oxide coating. A hole is then opened through the silicon layer and a metal electrode, as of chromium, is deposited directly upon the hypersensitive n^+ region to form the rectifying junction of the diode. The surface barrier diode (Schottky diode) exhibits a hypersensitive voltage variable capacitance effect where "hypersensitive voltage variable capacitance" means that the capacitance is approximately inversely proportional to the first power of the applied voltage as contrasted with normal voltage variable capacitance effects in PN junction devices wherein the capacitance is approximately inversely proportional to the one-half or one-third power of the applied voltage.

3,579,279
STEP MOTOR ACCELERATION-DECELERATION CONTROL SYSTEM
Seiuemon Inaba, Kawasaki-shi; Kanryo Shimizu, Tokyo; Yoshihiro Hashimoto, Yokohama-shi, and Kengo Kobayashi, Kawasaki-shi, Japan, assignors to Fujitsu Limited, Kawasaki, Japan
Filed May 15, 1969, Ser. No. 824,897
Claims priority, application Japan, May 16, 1968, 43-33240
Int. Cl. H02v *37/00*
U.S. Cl. 318—696 7 Claims



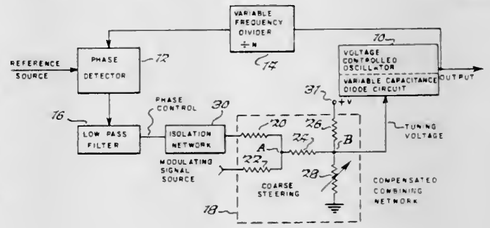
A pulse control circuit is connected between the pulse supply for supplying a train of control pulses to a step motor and the motor. The pulse control circuit gradually increases the frequency of pulses in the beginning of the pulse train and gradually decreases the frequency of pulses in the end of the pulse train thereby enabling proper starting and stopping of a motor operating at high speed.

3,579,280
ELECTRICAL GROUND FAULT DETECTOR WITH TRANSFORMER COUPLING, A BATTERY SUPPLY SOURCE AND BATTERY CHARGING MEANS
Douglas A. Florance, Vestal, and Lloyd P. Nordholm, Binghamton, N.Y., assignors to Flo-Root, Inc., Village of Endicott, N.Y.
Filed May 19, 1969, Ser. No. 825,911
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 1 Claim



A ground fault detector applied to an electrical supply system is disclosed. It utilizes a ring-type current transformer, a battery power source, and a solid-state control device operable by preselected current imbalance to energize an alarm. In addition, a modification of the apparatus includes a charging circuit inductively coupled to a branch of the monitored electrical supply to maintain the capability of the battery.

3,579,281
COMBINING NETWORK PROVIDING COMPENSATED TUNING VOLTAGE FOR VARACTOR
George H. Kam, Tonawanda, and Richard J. Hughes, Williamsville,, N.Y., assignors to Sierra Research Corporation
Filed June 4, 1969, Ser. No. 830,290
Int. Cl. H03c *3/22*
U.S. Cl. 332—30V 9 Claims



A control circuit for an indirect frequency synthesizer which combines a plurality of control functions into a single compensated tuning voltage for the varactor control element of an associated voltage controlled oscillator. The combining circuit includes a resistor network for summing phase control and modulating signals, and a variable resistance circuit for generating a coarse steering signal. The summing network is resistively connected to the variable resistance circuit to form a variable impedance resistor divider operative to attenuate the combined phase control and modulating signals in a manner inversely related to the magnitude of the coarse steering signal and to combine the attenuated control signals with the coarse steering signal and to combine the attenuated control signals with the coarse steering voltage to provide the varactor tuning signal. More specifically, the attenuation provided by the impedance divider is operative to substantially compensate the variation in voltage versus frequency sensitivity of the varactor with changes in the coarse steering voltage.

3,579,282

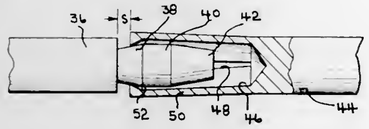
TRANSMISSION LINE CONNECTOR WITH MEANS INCLUDING CAM SURFACES FOR ALTERING CONNECTOR ELEMENT DIMENSIONS TO COMPENSATE FOR JUNCTION GAPS, AND METHOD THEREFOR

William Dean Couper, Palmyra, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 3, 1969, Ser. No. 788,812

Int. Cl. H01p *1/00, 5/08*

U.S. Cl. 333—97 **6 Claims**



A microwave coaxial connector structure is disclosed which features mating contact elements shaped to provide automatic compensation for physical discontinuities caused by improper mating. The contact elements include a male portion having a diameter which varies along a segment thereof and a female portion which engages such segment and is displaced radially, more or less depending upon the degree of seating, or relative axial position, of the segment within the female portion. If contact elements are not fully seated a high impedance mismatch is caused by a radial gap therebetween. The invention structure operates to create a counterbalancing low impedance due to the radial expansion of the mating element. The balancing low impedance is made to be physically close to the high impedance relative to signal wavelength. The invention is also taught in a reverse structure for outer conductive mating parts of a connector.

3,579,283

CAM GRIP FLAT CONDUCTOR CONNECTOR

Norman Welburn, Watford, England, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 4, 1968, Ser. No. 765,221

Claims priority, application Great Britain, Oct. 12, 1967, 46563/67

Int. Cl. H01r *9/08*

U.S. Cl. 339—217 **2 Claims**

An electrical connector primarily for flat conductor cable uses a spring-loaded cam to provide backup pressure between a conductor of the cable and a contact in the connector.

3,579,284

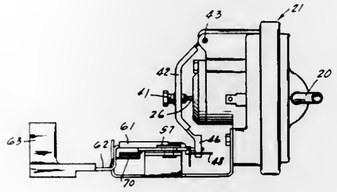
RESET AND ADJUSTMENT MECHANISM FOR A PRESSURE-RESPONSIVE SWITCH

Anthony Mason, Benton Harbor, and Clifton A. Cobb, St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

Filed July 1, 1968, Ser. No. 741,763

Int. Cl. H01h *35/40*

U.S. Cl. 200—83 **6 Claims**



A pressure-responsive switch assembly of the type used, for example, as a liquid level control in washing machines, including a slide means which is operable to automatically reset the diaphragm of the pressure-responsive switch when an adjustment is to be made of the operating point of the switch by advancing to a higher setting.

3,579,285

HYDRAULIC ANTITHEFT SYSTEM FOR VEHICLES

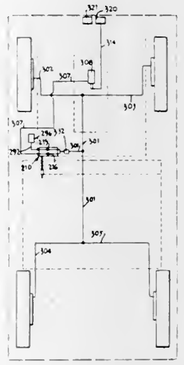
Emile Joseph-Henri Verdier, St. Laurent, Quebec, Canada, assignor to Aktiebolaget Bofors, Bofors, Sweden

Continuation-in-part of application Ser. No. 452,125, Apr. 30, 1965. This application July 18, 1968, Ser. No. 751,668

Claims priority, application Canada, May 8, 1964, 902,304

Int. Cl. B60r *25/08*

U.S. Cl. 307—10 **12 Claims**



An antitheft apparatus for use on a vehicle comprising a key operated valve adapted to retain fluid in the brake lines of the vehicle so that the brakes remain applied. The valve for use in the system being specially formed so that fluid pressure tending to hold the valve closed will not make it difficult to turn the key to open the valve.

CHEMICAL

3,579,286

POLYALKYLENE POLYAMINE THIOSULFONATED SULFUR DYE COMPOSITION AND DYEING THEREWITH

Christian Heid, Frankfurt am Main-Fechenheim, Willi Gunzert, Frankfurt am Main, and Fritz Engelhardt, Frankfurt am Main-Fechenheim, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft Frankfurt am Main-Fechenheim, Germany

No Drawing. Filed Aug. 23, 1968, Ser. No. 753,998

Claims priority, application Germany, Aug. 27, 1967, P 16 19 404.0

Int. Cl. D06p *1/30*

U.S. Cl. 8—37 **9 Claims**

Thiosulfonate forms of sulfur dyes are fixed on cellulosic fibers by merely drying the fibers after they have been impregnated with the dye and with a polyalkylene polyamide having at least three primary or secondary amine groups and in which the alkylene groups have two to four carbons.

3,579,287

BLEACHING PROCESS

Xavier Kowalski, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed June 11, 1969, Ser. No. 832,437

Int. Cl. D06l *3/06*

U.S. Cl. 8—108 **5 Claims**

Textile fibers bleached with solutions of chlorocyanuric acids, salts or complexes are soured by contact with an aqueous acidic solution containing hydroxy ethylidene diphosphonic acid, sodium hexametaphosphate, ethylene diamine tetraacetic acid, nitrilotriacetic acid, alkali metal salts of the foregoing acids or mixtures of these compounds as well as the sulfite salts conventionally utilized in souring solutions. The process provides fibers characterized by improved appearance and reduced heat sensitivity.

3,579,288

PERMSELECTIVE CELLULOSE MEMBRANES REACTED WITH A SULFONATED TRICHLOROPYRIMIDINE DYE, 2,3 - DICHLOROQUINOXALINE DYE OR DICHLORO-s-TRIOZINES

Adalbert Suszer, Jerusalem, Israel, assignor to the State of Israel as represented by the Prime Minister's Office, Jerusalem, Israel

No Drawing. Filed Sept. 20, 1966, Ser. No. 580,595

Int. Cl. D06m *13/34*

U.S. Cl. 8—116.2 **5 Claims**

A process for making permselective membranes comprises reacting a cellulosic film or parchmentized cellulosic sheet of about 0.1 mm. thickness with an aqueous solution of a sulfonated compound of the group consisting of a sulfonated trichloropyrimidine dye, a sulfonated 2,3-dichloroquinoxaline reactive dye, and a sulfonated dichloro-s-triazine, in high concentration for a period of time in the order of at least three hours until said cellulosic film or sheet is converted to a permselective membrane exhibiting permselectivity exceeding 14 mv. in a cell containing N/10 to N/20 potassium chloride, and exhibiting an electrical resistance of less than 20 ohms/cm.^{2}.

3,579,289

ACID SALT FORM OF DEAE CELLULOSIC FABRIC PROVIDING BUILT-IN CATALYSIS FOR THE REACTION WITH AMINOPLASTS

Donald M. Soignet, Metairie, and Ruth R. Benerito, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Jan. 16, 1970, Ser. No. 3,514

Int. Cl. C08b *11/20;* **D06m** *13/40, 13/54*

U.S. Cl. 8—116.3 **7 Claims**

Diethylaminoethylated cellulosic fibers, the diethylaminoethyl groups of which are in an acid salt form, provide a built-in catalyst for the reaction of said fibers with methylolated nitrogen containing cross-linking agents with which said fibers are contacted.

3,579,290

STERILISATION OF SURGICAL INSTRUMENTS

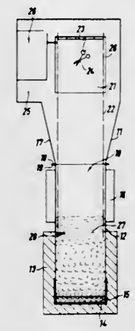
Richard Esdaile Pickstone, 36 Avon Trading Estate, London, W. 4, England

Continuation-in-part of application Ser. No. 713,395, Mar. 15, 1968. This application June 8, 1970, Ser. No. 44,018

Claims priority, application Great Britain, Mar. 16, 1967, 12,419/67

Int. Cl. A61l *1/00, 3/00*

U.S. Cl. 21—2 **20 Claims**



A method of and apparatus for sterilizing articles such as surgical instruments which method comprises suspending the object or instrument in a boiling inert liquid or in a saturated vapor thereof, said liquid having a boiling point within the range of 160° C. to 190° C. until the temperature of the said object has been raised to that of the boiling liquid and then raising it to a zone above the vapor of the boiling liquid until adhering liquid has evaporated under the sensible heat of the instrument.

3,579,291

REMOVING PHENYL AZIDE FROM GASES

Winfried Ludwig and Rudolf Oster, Ludwigshafen, and Hans Urbach, Lampertheim, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Dec. 3, 1969, Ser. No. 881,898

Claims priority, application Germany, Dec. 13, 1968, P 18 14 493.9

Int. Cl. B01d *47/02*

U.S. Cl. 23—2 **3 Claims**

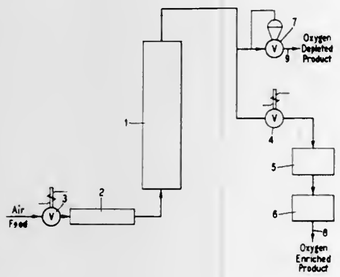
A process for removing phenyl azide from gas by passing the gas containing phenyl azide through 50 to 100 wt. percent sulfuric acid.

3,579,292

PROCESS AND COMPOSITION FOR SEPARATION OF OXYGEN FROM AIR USING STRONTIUM OXIDE-PEROXIDE AS THE CARRIER

Joseph T. Mullhaupt, Tonawanda, and Silviu A. Stern, De Witt, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 8, 1969, Ser. No. 789,908
Int. Cl. B01d *53/34;* **C01b** *13/08, 15/04*
U.S. Cl. 23—2 **22 Claims**



By incorporating at least one ion of a metal from Groups I-A, I-B and VIII of the Deming Periodic Table into a strontium oxide-peroxide reaction mass, a great increase in the oxidation and reduction rates of the mass is obtained. This increase in reaction rates makes it feasible to use this system as the oxygen carrier in a cyclic, reversible oxidation-reduction process for the separation of oxygen from air.

3,579,293

REMOVAL OF HYDROGEN SULFIDE FROM GASEOUS MIXTURES

Forrest G. Shultz and Gerald E. Chidester, Morgantown, and Fernand E. Collet, Star City, W. Va., assignors to the United States of America as represented by the Secretary of the Interior

No Drawing. Filed Oct. 10, 1969, Ser. No. 865,535
Int. Cl. B01d *53/14*
U.S. Cl. 23—2S **3 Claims**

Hydrogen sulfide is removed from gaseous mixtures by contacting the mixtures at elevated temperature with an absorbent comprising iron oxide and fly ash.

3,579,294

PROCESS FOR EXTRACTION OF ALUMINA FROM ORES BY SOLUTION OF CAUSTIC SODA AND SODIUM ALUMINATE

Louis Tamisé, Douvres-la-Delivrande, and Jacques Millet, Versailles, France, assignors to Pechiney-Compagnie de Produits Chimiques et Electrometallurgiques, Paris, and Societe Appareils et Evaporateurs Kestner, Lille, France

Filed Mar. 15, 1968, Ser. No. 713,421
Claims priority, application France, Mar. 20, 1967, 99,393
Int. Cl. C01f *7/02*
U.S. Cl. 23—52 **10 Claims**

Process and equipment for the continuous extraction of alumina from bauxite by dissolution in aqueous caustic soda and sodium aluminate solutions in which use is made of a plurality of autoclaves of increasing temperature through which the suspension flows in series from one to the next in a sequence of stages and a plurality of expansion vessels of decreasing pressure in series with the autoclaves and through which the suspension flows in series.

3,579,295

PROCESS FOR ATTACK OF BAUXITE WITH ALKALINE SOLUTION

Louis Tamisé, Douvres-la-Delivrande, and Jacques Millet, Versailles, France, assignors to Pechiney Compagnie de Produits Chimiques et Electrometallurgiques, Paris, and Societe Appareils et Evaporateurs Kestner, Lille, France

Filed Mar. 15, 1968, Ser. No. 713,422
Claims priority, application France, Mar. 20, 1967, 99,394
Int. Cl. C01f *7/02*
U.S. Cl. 23—52 **9 Claims**

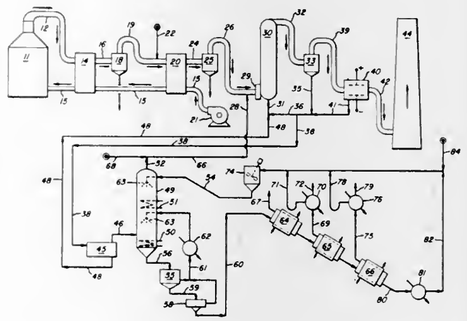
A process for the continuous attack of ores containing alumina with an aqueous solution of caustic soda and sodium aluminate in which use is made of a series of stages each having an autoclave with the autoclaves increasing in temperature from stage to stage in the direction of flow of the suspension with the autoclave in one stage receiving suspension from the preceding stage and expansion vessels with the expansion vessels decreasing in pressure in countercurrent relation with the autoclaves of increasing temperature.

3,579,296

DUAL CYCLE TREATMENT OF SULFUR DIOXIDE CONTAINING FLUE GAS AND THE LIKE

Everett Douglas Cann, Freeport, Ill., assignor of fractional part interest to William T. Neiman

Filed Nov. 13, 1967, Ser. No. 682,435
Int. Cl. C01b *17/60*
U.S. Cl. 23—178 **11 Claims**



A method is provided for treating flue gas and the like for sulfur dioxide removal and recovery. The gas, containing a minor but polluting amount of sulfur dioxide and substantially no sulfur trioxide, is contacted with ammonia in the presence of water to form an ammonium sulfite. This is separated and, in the absence of oxygen, reacted with an aqueous alkaline earth metal oxide or with zinc oxide to liberate the ammonia for recycle and to form insoluble alkaline earth metal or zinc sulfite. The latter is dried, dehydrated, and thermally decomposed to liberate a concentrated stream of sulfur dioxide and to form alkaline earth metal oxide or zinc oxide for recycle. Procedures are disclosed for efficiently conducting the above processing steps and operations.

3,579,297

PROCESS OF MANUFACTURING AMMONIUM SALTS

Karl Gote Ekblom, Ljungaverk, Sweden, assignor to Fosfatholaget AB, Stockholm, Sweden

Filed June 18, 1968, Ser. No. 738,033
Claims priority, application Sweden, Sept. 15, 1967, 12,742/67
Int. Cl. C01c *1/18, 1/28*
U.S. Cl. 23—103 **4 Claims**

This invention relates to a method for controlling the reaction between ammonia and acid so as to minimize the formation of excess ammonia, which comprises withdrawing some vapor from the reaction zone, dividing said vapor into two streams, contacting it with an acid compound in excess of that needed to neutralize the free ammonia in the stream, cooling each stream to form an aqueous condensate, measuring the conductivity of each condensate, and regulating the introduction of reactants to the reaction zone in accordance with said conductivity measurements.

3,579,298

PRODUCTION OF AMMONIUM NITRATE

George O'Brien and John S. Hubby, Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed Aug. 5, 1968, Ser. No. 750,327
Int. Cl. C01c *1/18*
U.S. Cl. 23—103 **3 Claims**

An aqueous stream comprising essentially water and a minor amount of ammonia is reacted with at least enough nitric acid to produce an ammonia-free water stream containing a minor amount of ammonium nitrate, and then utilizing said ammonium nitrate-containing stream to absorb at least a portion of nitrogen dioxide gas to produce nitric acid containing a minor amount of ammonium nitrate.

3,579,299

POROUS SILICATE

Robert H. Sams, Aldan, and Newton W. McCready, Newtown Square, Pa., assignors to Philadelphia Quartz Company, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 540,204, Apr. 5, 1966. This application July 30, 1968, Ser. No. 748,644
Int. Cl. C01b *33/00;* **C11d** *3/04*
U.S. Cl. 23—110A **6 Claims**

A low bulk density, crystallized, alkaline sodium silicate or a detergent containing a low bulk density, crystallized, alkaline sodium silicate is formed by the addition of powdered silicon metal to a crystallizing mass of the alkaline sodium silicate to produce a foramenifer ous product of uniform porosity.

3,579,300

CONTINUOUS PROCESS FOR THE PRODUCTION OF CALCIUM SULPHATE HEMI-HYDRATE FROM GYPSUM

Martin S. Bloom, Norton-on-Tees, and Martin Granger Brown, Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of abandoned application Ser. No. 414,244, Nov. 27, 1964. This application Aug. 4, 1969, Ser. No. 847,022
Claims priority, application Great Britain, Dec. 3, 1963, 47,675/63
Int. Cl. C01f *11/46*
U.S. Cl. 23—122 **6 Claims**

Process for producing calcium sulphate alpha-hemihydrate by subjecting a slurry of gypsum and water to superatmospheric pressure sufficient to maintain the water in the liquid state at a preselected mean temperature of at least 130° C., continuously passing the said slurry into a reactor having an inlet and an outlet, injecting into said slurry sufficient steam at a pressure and temperature sufficient to maintain said slurry in the reactor at least at said superatmospheric pressure and preselected mean temperature, continuously agitating said slurry in reactor, and continuously withdrawing calcium sulphate alpha-hemihydrate from the outlet without reducing the pressure therein.

3,579,301

CONDENSED PHOSPHORIC ACID HAVING REDUCED VISCOSITY

Robert A. Wiesboeck, Atlanta, and Charles C. Stone, Doraville, Ga., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed June 28, 1968, Ser. No. 740,918
Int. Cl. C01b *25/24*
U.S. Cl. 23—165 **7 Claims**

To reduce the viscosity of condensed phosphoric acids, so that they can be pumped or otherwise readily handled or treated, the F content of the acids is raised above two percent and preferably above four percent. The fluorine may be added in the form of a fluorine-containing compound, such as fluorophosphoric acid, difluorophosphoric acid, hexafluorophosphoric acid, hydrogen fluoride, etc. The fluorine treatment inhibits crystallization of the acid and, in the case of wet process phosphoric acid containing solids, dissolves solids in the acids.

3,579,302

METHOD OF FORMING SULFUR FROM SO_2-CONTAINING GASES

Verner B. Sefton, Toronto, Ontario, Canada, assignor to Ontario Research Foundation, Sheridan Park, Ontario, Canada

Continuation-in-part of application Ser. No. 722,719, Apr. 19, 1968. This application June 25, 1969, Ser. No. 836,501
Int. Cl. C01b *17/04*
U.S. Cl. 23—226 **9 Claims**

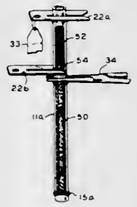
Hydrogen sulphide-containing gases used to react with sulphur dioxide in a waste effluent gas stream to thereby produce sulphur is generated by reaction between sulphur, a hydrocarbon fuel and steam at high temperatures. The high temperatures necessary for the reaction of sulphur, hydrocarbon fuel which may be the same as or different from that used to form the hydrogen sulphide-containing gases. The sulphur used to form the hydrogen sulphide may be that formed in the reaction of the sulphur dioxide and the hydrogen sulphide-containing gases.

3,579,303

SYSTEM FOR HANDLING SPECIMENS AND OTHER SUBSTANCES IN MEDICINE AND PHYSICAL SCIENCES

Donald E. Pickering, 830 NW. St. Helens Ave., Portland, Oreg. 97229

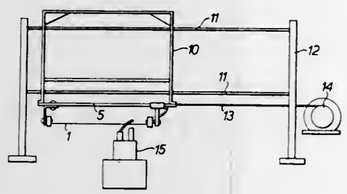
Filed Mar. 6, 1968, Ser. No. 710,974
Int. Cl. G01n *1/00, 33/16*
U.S. Cl. 23—230 **11 Claims**



A method of and apparatus for handling, processing, testing, storing, transporting and otherwise using biomedical, biological, chemical and other specimens, re-

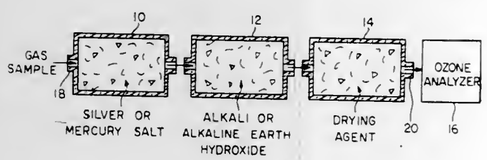
agents and substances from the time of their initial procurement through their transport, storage and ultimate laboratory or other usage and final disposal. The system embodies the use of a length of transparent or translucent, resilient, sterile and disposable tubing divided by heat or other seals into a series of linked and sealed segments. Individual segments are severed from the string of segments as needed, filled with a freshly procured specimen or reagent, and then resealed mechanically with a selectively removable clip to which an identification tag can be attached. Additional temporary or permanent sealing of a tube segment can be achieved as needed for separation of substances through the use of additional clips. A modification of the apparatus includes the use of a swab and transport media to procure, contain and transport or store microbiological specimens.

3,579,304
HEAT SCANNED CHROMATOGRAPHIC DETECTOR
Frederick Bolton Padley, Welwyn Garden City, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Apr. 12, 1968, Ser. No. 720,871
Claims priority, application Great Britain, Apr. 21, 1967, 18,448/67
Int. Cl. G01n *31/12*
U.S. Cl. 23—232 **8 Claims**



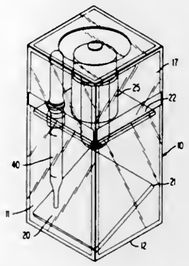
A method of detection particularly suitable to thin layer chromatography in which chemically separated materials on a carrier, produced for example by thin layer chromatographic elution, are scanned and detected by a heat source such as the flame of a flame ionisation detector.

3,579,305
SCRUBBER APPARATUS
Radhakrishna M. Neti, Brea, Calif., assignor to Beckman Instruments, Inc.
Filed July 25, 1968, Ser. No. 747,721
Int. Cl. C09k *3/00;* **G01n** *31/06*
U.S. Cl. 23—232 **3 Claims**



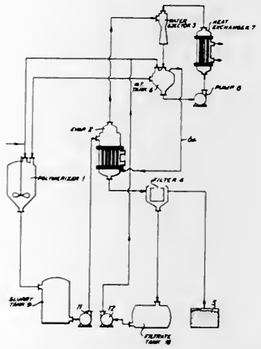
A solid phase chemical scrubber for selectively removing interferrents from an ozone bearing sample gas stream which is to be analyzed for its ozone content. The scrubber contains an alkali or alkaline earth hydroxide, preferably $Ca(OH)_2$ or KOH, which effectively removes both positive and negative interferrents from the gas stream, but does not affect the ozone in the stream.

3,579,306
DIAGNOSTIC TEST DEVICE
Margaret M. Crane, New York, N.Y., assignor to Organon, Inc., West Orange, N.J.
Filed Jan. 22, 1969, Ser. No. 792,936
Int. Cl. A45c *11/00;* **G01n** *21/06, 33/16*
U.S. Cl. 23—253 **10 Claims**



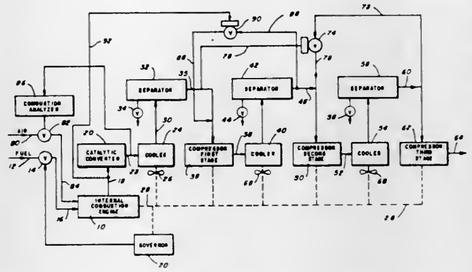
A test kit for the performance of analytical and diagnostic determinations involving visual indication of test results comprises a transparent container having a closure utilizable as a sampling device, a platform supported within the container and having an integral upwardly extending tube supporting a test vial for holding test reagents, and a downwardly extending integral tube guiding and supporting a test dropper, and a mirror set at an angle located in the bottom portion of the container to reflect the results of a test performed within the test vial through the container wall so as to be viewable outside the container.

3,579,307
APPARATUS FOR RECOVERING ACRYLONITRILE MONOMER IN THE PRODUCTION OF A POLYMER
Eiichi Wakita and Kunio Tokumitsu, Fuji-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
Original application July 10, 1963, Ser. No. 294,101, Divided and this application Dec. 31, 1968, Ser. No. 788,188
Int. Cl. B01d *3/10;* **B01j** *1/00;* **C07c** *121/30*
U.S. Cl. 23—263 **8 Claims**



An acrylonitrile polymerizer is connected to an evaporator to recover unpolymerized monomers. A water ejector or jet condenser is connected to the evaporator to recover gaseous monomers therefrom. A tank receives a stream from the ejector or condenser with monomer condensate therein while a filter connected to the evaporator produces a solid filtered material and a filtrate which is fed to the ejector or condenser to form the stream. The tank returns part of the stream and condensate to the polymerizer.

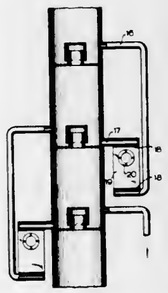
3,579,308
APPARATUS FOR MANUFACTURING HIGH PRESSURE INERT GAS
George H. Gower, Tulsa, Okla., assignor to Inert Gas Corporation, Tulsa, Okla.
Filed Sept. 25, 1969, Ser. No. 860,908
Int. Cl. B01j *7/00*
U.S. Cl. 23—281 **5 Claims**



This invention relates to an apparatus for manufacturing high pressure inert gas utilizing hydrocarbon fuel, the gas being produced by the burning of hydrocarbon fuel in an internal combustion engine, the exhaust gases therefrom being conveyed through a catalytic converter whereby substantially inert gas is derived therefrom, and including means of controllably recycling such inert gas through engine driven compressor stages to vary the loading on the engine and thereby vary the inert gas output in response to the demand.

An additional embodiment of the invention includes means to maintain a positive pressure in all portions of the system, including the engine exhaust manifold and catalytic converter, so that any inadvertent leak in the system will not result in air being drawn into the system.

3,579,309
COLUMN FOR CARRYING OUT ORGANIC CHEMICAL REACTIONS IN CONTACT WITH FINE, PARTICULATE CATALYSTS
Kurt Sennewald and Klaus Gehrmann, Knapsack, near Cologne, and Stefan Schafer, Bruhl, near Cologne, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany
Filed Oct. 7, 1968, Ser. No. 765,337
Claims priority, application Germany, Nov. 18, 1967, P 16 67 139.9
Int. Cl. B01j *9/04;* **C07c** *69/66*
U.S. Cl. 23—288 **2 Claims**

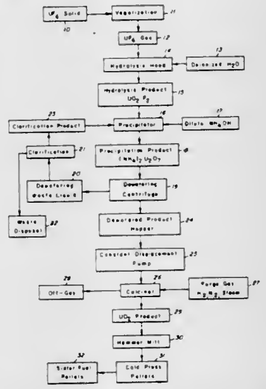


Column for carrying out organic chemical reactions in contact with fine, particulate catalysts, the column being formed with interchangeable, catalyst-receiving rection vessels, which are arranged outside the column, preferably in staggered relationship to each other. between individual column tray outlet and inlet openings projecting outwardly.

3,579,310
PREPARATION OF ACICULAR RUTILE TiO_2
George L. Lewis, Wilmington, and Carl H. Muendel, Centerville, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 624,716, Mar. 21, 1967. This application June 28, 1967, Ser. No. 655,984
Int. Cl. B01d *9/00;* **C01g** *23/08*
U.S. Cl. 23—301 **11 Claims**

Pigmentary single acicular rutile TiO_2 crystals, at least 50% by weight of the particules of which have an average cross-sectional dimension of 0.01 to 0.5 micron and a length-to-cross sectional ratio of 3:1 to 50:1, obtained by calcining at 725–1000° C., a blended titania-salt-promoter mixture made up of preformed TiO_2, a salt comprising sodium chloride, and an oxy-compound of phosphorus (phosphate), and leaching of the calcined product to recover the acicular rutile pigment.

3,579,311
PROCESS AND APPARATUS FOR PRODUCING UO_2 POWDER
John J. McCoy, San Jose, Calif., assignor to General Electric Company
Filed Apr. 25, 1968, Ser. No. 724,119
Int. Cl. C01g *43/02*
U.S. Cl. 23—355 **12 Claims**

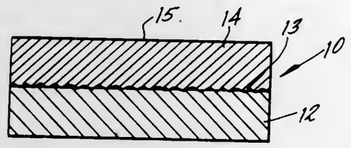


An improved process and apparatus for preparing uranium dioxide powder suitable for use in the fabrication of fuel for nuclear reactors. In a process comprising steps of hydrolyzing uranium hexafluoride to form an aqueous uranyl fluoride solution, treating with ammonia to precipitate ammonium diuranate, dewatering and drying the precipitate, and finally calcining the precipitate to form uranium dioxide, the improvement wherein the precipitate is dewatered to about 40% to about 60% by weight, preferably about 50% by weight water and is thereafter directly calcined.

3,579,312
PRINTED CIRCUITS FROM NONMIGRATING SOLDERS
Oliver A. Short, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Original application Mar. 28, 1967, Ser. No. 626,425, now Patent No. 3,472,653, dated Oct. 14, 1969. Divided and this application Apr. 28, 1969, Ser. No. 819,941
Int. Cl. H05k *1/04;* **C22c** *5/00*
U.S. Cl. 29—195 **5 Claims**

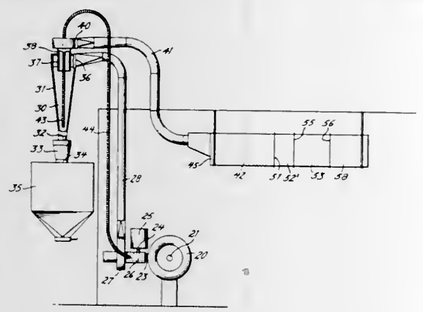
Printed circuits of high reliability fabricated with a non-migrating solder comprising an alloy of gold, tin and germanium. The invention is particularly suitable in circuits with non-migrating conductor compositions.

3,579,313
COMPOSITE OF STEEL AND ALUMINUM CONTAINING ZINC AND BORON, AND A CABLE SHEATH MADE THEREFROM
Michael J. Pryor and William H. Anthony, Hamden, Conn., assignors to Olin Mathieson Chemical Corporation
Filed Oct. 25, 1967, Ser. No. 677,955
Int. Cl. B32b *15/00*
U.S. Cl. 29—196.2 **8 Claims**



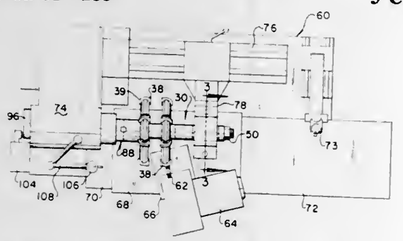
This invention relates to a novel high strength Al–Zn–B alloy metallurgically bonded to steel and heat treating processes therefore, for use in both aerial and underground cable sheathing.

3,579,314
DUST AND SMOKE REMOVAL IN TIRE BUFFING
John J. Cunningham, Jr., Wilmington, Del., assignor to Quinn Brothers, Incorporated, Philadelphia, Pa.
Filed May 20, 1969, Ser. No. 826,165
Int. Cl. B24b *55/06*
U.S. Cl. 51—273 **2 Claims**



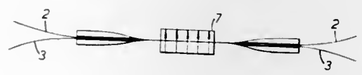
For removing dust and smoke from tire buffing, a cyclone dust collector, a spray chamber and an absolute filter in combination. There is preferably a bypass from a high pressure point in the cyclone dust collector back to a hood adjoining the tire buffing for lengthening the time of a dust and smoke cycle.

3,579,315
METHOD OF PRECISION FORM MILLING
William Rowe Hufendick, Quincy, Ill., assignor to Gardner-Denver Company
Filed May 1, 1968, Ser. No. 725,647
Int. Cl. B24b *1/00*
U.S. Cl. 51—288 **3 Claims**



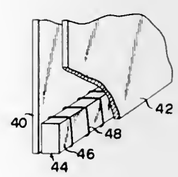
Precision in form milling processes using arbor-type milling cutters is improved by providing a unitary arbor and cutter assembly which is mounted on a cutter grinding machine and rotated for individual cutter tooth forming and sharpening thereby establishing an axis and plane of rotation for each point on the cutter profile. After grinding and sharpening of the cutter teeth, the unitary arbor-cutter assembly is transferred to a milling machine and mounted in a manner duplicating the grinder mounting, thereby exactly preserving the axis and plane of rotation of the cutter which was established during the grinding operation.

3,579,316
PROCESS FOR OPTICAL WAVEGUIDE COUPLER
Richard Burnaby Dyott, Chalfont St. Peter, and George Archer Clark, Stanmore, England, assignors to Her Majesty's Postmaster General, London, England
Filed Nov. 4, 1968, Ser. No. 773,195
Claims priority, application Great Britain, Nov. 8, 1967, 50,919/67
Int. Cl. C03c *23/20;* **G02b** *5/14;* **H01s** *3/00*
U.S. Cl. 65—4 **4 Claims**



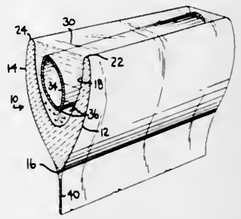
A method is disclosed of coupling optical waveguides together for energy transfer from one waveguide to another. The waveguide ends are inserted into a glass capillary tube of refractive index lower than that of the waveguide cladding. The closely proximate ends of the waveguides and the capillary are heated to softening point and then pulled out until the diameter of the sleeve approximates to that of a waveguide.

3,579,317
METHOD OF MUTUALLY BONDING PARTS BY USE OF GLASS
Eizo Goto, Chigasaki-shi, Japan, assignor to Tokyo Shibaura Electric Co. Ltd., Kawasaki-shi, Japan
Filed Nov. 4, 1968, Ser. No. 772,891
Claims priority, application Japan, Nov. 9, 1967, 42/71,689; Nov. 11, 1967, 42/72,215
Int. Cl. C03c *27/00*
U.S. Cl. 65—43 **3 Claims**



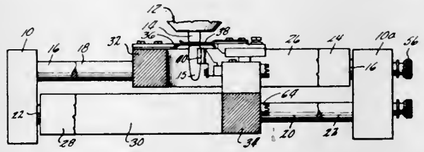
A method of mutually bonding parts with glass layers which comprises inserting a spacer between those portions of a plurality of assembled parts requiring bonding in a manner to define a very narrow space with said portions. The spacer comprises an angular column of either glass or ceramic material with a metal wire wound around it. Contacting the end faces of said portions of the assembly requiring bonding with the surface of an electrically heated molten glass bath and removing the assembly from the bath. The bonding of the assembled parts being due to the cooling into solid layers of the molten glass filled by capillary action into the spaces of said portions requiring bonding.

3,579,318
METHOD OF AND APPARATUS FOR FORMING GLASS SHEETS BY DRAWING DOWNWARDLY
Cecil R. Ward, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed May 2, 1968, Ser. No. 726,020
Int. Cl. C03b *17/00*
U.S. Cl. 65—90 **4 Claims**



A sheet of glass is drawn downwardly from a contoured nozzle incorporating a trough into which glass is fed through a pipe or conduit from a melter. The glass is extruded upwardly between the inner walls of the nozzle and the feed conduit fills the nozzle and overflows its edges.

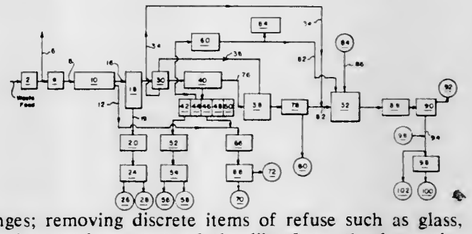
3,579,319
ADJUSTABLE SHEAR BLADE AND DROP GUIDE MOUNTING FOR MOLTEN GLASS STRAIGHT LINE SHEARS
Frederick J. Wythe, Hebron, and Harald Hoette, Farmington, Conn., assignors to Emhart Corporation, Bloomfield, Conn.
Filed Apr. 25, 1968, Ser. No. 723,985
Int. Cl. C03b *5/38*
U.S. Cl. 65—334 **7 Claims**



A fixed frame for the shears is mounted beneath the outlet of a feeder bowl, and a pair of horizontally reciprocable carriages are mounted in the frame for movement in opposite directions, and carry opposed pairs of shear blades for severing gobs of glass from a plurality of suspended molten glass columns accumulated at said feeder bowl outlet. One blade in each pair is movably mounted in its associated carriage for vertical adjustment with respect to the other blade, and a hand operated adjustment knob carries a shaft which is slidable in the frame and its inner end is engageable with the blade mounting means when the carriage is retracted for accomplishing these adjustments during operation of the shears. A drop guide is also provided below each adjustable blade in each of said pairs of blades, and said drop guide is adjustable horizontally through another hand knob and shaft located above the shear blade adjusting knob.

3,579,320
PROCESS FOR PRODUCING AND RECOVERING VALUABLE MATERIALS FROM MUNICIPAL WASTE
Marvin Presses, Liberty Township, Trumbull County, Ohio, assignor to General Ecological Systems, Inc., Pittsburgh, Pa.
Filed Aug. 18, 1969, Ser. No. 850,808
Int. Cl. C05f *11/08*
U.S. Cl. 71—9 **6 Claims**

A process for producing and recovering valuable materials from a burden comprising a mixture of organic and inorganic waste materials comprising the steps of separating large refuse items from the burden and separately recovering same; opening containers of refuse present in the burden and separately recovering the containers; subjecting the burden to a magnetic separation operation and separately recovering the magnetic materials; classifying the non-magnetic materials according to size

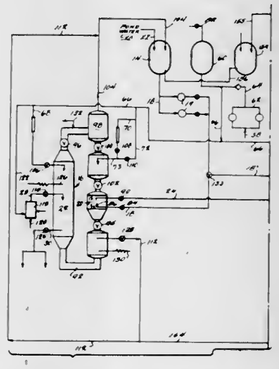


ranges; removing discrete items of refuse such as glass, plastic, metals, paper and the like from the large size range material and separately recovering the discrete refuse items; comminuting the large and intermediate size range materials and combining the comminuted material with the small size range material to form an organic mass; composting the organic mass, preferably in a mixture with raw sewage; and recovering a sterile compost.

3,579,321
AMMONIUM PHOSPHATE FERTILIZER COMPOSITION AND METHOD
Jerry H. Stoller, Springfield, Ill., assignor to Brandt Chem. Co., Inc., Pleasant Plains, Ill.
No Drawing. Filed Mar. 9, 1970, Ser. No. 18,402
Int. Cl. C05f *11/00*
U.S. Cl. 71—25 **10 Claims**

A fluid ammonium phosphate composition and method utilizing wet process phosphoric acid or spent phosphoric acid which contain metallic impurities. Lignin sulfonate is added to the acid prior to ammoniation in sufficient quantities to prevent formation of gelatinous precipitate during ammoniation.

3,579,322
RECOVERY OF PHOSPHATE FROM PHOSPHATE CONTAINING POND WATER
Irwin R. Higgins, Oak Ridge, Tenn., assignor to Chemical Separations Corporation, Oak Ridge, Tenn.
Filed Dec. 1, 1966, Ser. No. 598,418
Int. Cl. C05b *7/00*
U.S. Cl. 71—34 **5 Claims**



A continuous process for treating a waste aqueous stream containing phosphate values to recover said phosphate values including initially removing contaminating cations from the waste aqueous stream by contacting the same with a cation exchange resin bed and then contacting the essentially contaminating cation-free aqueous

stream with an anion exchange resin bed to eliminate the phosphate values therefrom and then removing the phosphate values loaded on the anion exchange resin with a regenerating agent. In another embodiment, the waste aqueous stream by-passes the cation exchange resin and is contacted only with a weak-base anion exchange resin which is, thereafter, contacted with a regenerating agent, such as ammonium hydroxide to liberate the phosphate values therefrom.

3,579,323

PROCESS FOR THE MANUFACTURE OF A CHLORIDE-FREE HIGH-STRENGTH POTASSIUM AMMONIUM NITRATE PHOSPHATE FERTILISER

Wolfgang Gauster, Linz (Danube), Walter Muller, Leonding, near Linz (Danube), and Alfred Schmidt and Ferdinand Weinrotter, Linz (Danube), Austria, assignors to Osterreichische, Stickstoffwerke Aktiengesellschaft, Linz (Danube), Austria

No Drawing. Filed Sept. 26, 1968, Ser. No. 763,017
Int. Cl. C05b *11/06;* **C05c** *5/02;* **C05d** *1/02*
U.S. Cl. 71—35 **2 Claims**

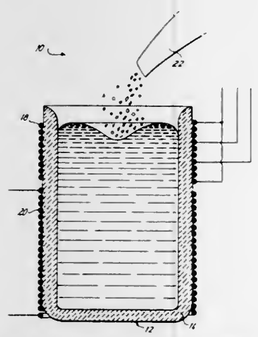
Process for the manufacture of chloride-free high-strength potassium ammonium nitrate phosphate fertilisers by reaction of potassium chloride with liquid or gaseous N_2O_4 at a temperature of at most 80° C. The reaction medium used is phosphoric acid or a mixture of phosphoric acid and nitric acid. After removal of the nitrosyl chloride formed and neutralising the resulting acid/potassium nitrate suspension with ammonia the mixture is shaped and dried.

3,579,324

METHOD FOR INDUCTION MELTING OF FINE PARTICLES

Theodore R. Kennedy, Willingboro, and Henry M. Rowan, Moorestown, N.J., assignors to Inductotherm Corporation, Rancocas, N.J.

Filed Nov. 18, 1968, Ser. No. 776,450
Int. Cl. C22d *7/00;* **H05b** *5/08*
U.S. Cl. 75—10 **1 Claim**



The ability of a coreless induction furnace to melt fine particles is enhanced by providing a lower single phase coil which supplies melting currents and an upper polyphase coil which stirs the molten metal so as to lift the outer rim of molten metal adjacent the surface.

3,579,325

STEEL-MAKING PROCESS EMPLOYING AN AUXILIARY COMPOSITION

Joseph K. Stone and Peter J. Beck, Berkeley, and Edward J. Prince, Oakland, Calif., assignors to Kaiser Industries Corporation, Oakland, Calif.

No Drawing. Filed Dec. 26, 1967, Ser. No. 693,123
Int. Cl. C21c *5/28, 5/36*
U.S. Cl. 75—51 **7 Claims**

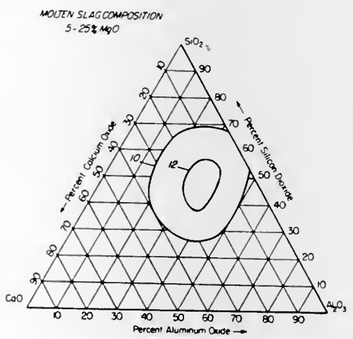
A composition for charging to a metallurgical furnace, such as an oxygen steel furnace which is a heat- and flux-producing agent consisting essentially of a granular admixture of from 5% to 95% calcium carbide and from 95% to 5% silicon carbide. Both components provide fuel to enable the use of higher amounts of scrap metal; and in one embodiment the silicon carbide and calcium carbide are admixed in a ratio to give an eventual slag of suitable lime-silica ratio. The admixture of silicon carbide and calcium carbide is advantageously admixed with a minor amount of a hydrocarbon bonding agent which is at least semi-solid at ordinary room temperatures, such as tar or pitch, and formed into compacts, e.g. pellets or briquettes. Powdered aluminum metal can also be incorporated.

3,579,326

PROCESS FOR THE PRODUCTION OF MAGNESIUM

Julian M. Avery, Greenwich, Conn.
(47 Old Orchard Road, Chestnut Hill, Mass. 02167)

Filed June 26, 1967, Ser. No. 648,856
Int. Cl. C22b *45/00*
U.S. Cl. 75—67 **11 Claims**



A process for the production of magnesium by reducing magnesium oxide from an oxidant containing a major proportion of magnesia with reductant containing a metallic aluminum-silicon alloy, having a ratio of silicon to aluminum of at least 0.8 to 1, at a temperature of at least 1400° C. and in the presence of a molten slag of defined composition and comprising 5–25 percent magnesium oxide, and less than 30 percent calcium oxide. The reductant and slag are preferably chosen having compositions falling within the areas shown in the figures. As a consequence, the reductant and slag are coordinated such that much of the alumina and silica of the slag are derived by the oxidation of the reductant.

3,579,327

COBALT REMOVAL FROM ZINC ELECTROLYTE SOLUTION

Tokushige Hasegawa, Narashino-shi, Kuninobu Makimoto, Aizu-Wakamatsu-shi, and Seiji Nihei and Jiro Takahira, Bandai-machi, Yama-gun, Japan, assignors to Nisso Kinzoku Kabushiki Kaisha, Tokyo-to, Japan

Filed Apr. 9, 1968, Ser. No. 719,951
Int. Cl. C22b *19/32*
U.S. Cl. 75—109 **6 Claims**

Zinc dust containing a small amount of antimony or antimony and lead as alloy elements is added into an electrolyte used in hydrometallurgy of zinc, in order to remove cobalt impurities from the electrolyte of zinc sulfate solution.

3,579,328

PROCESS FOR THE PRODUCTION OF FERROVANADIUM DIRECTLY FROM SLAG OBTAINED FROM VANADIUM-CONTAINING PIG IRON

Helge Aas, Svelgen, and Rolf Nordheim, Oslo, Norway, assignors to Christiania Spigerverk, Oslo, Norway

No Drawing. Filed Apr. 11, 1968, Ser. No. 720,461
Claims priority, application Norway, May 31, 1967, 168,400
Int. Cl. C22c *39/50*
U.S. Cl. 75—133.5 **5 Claims**

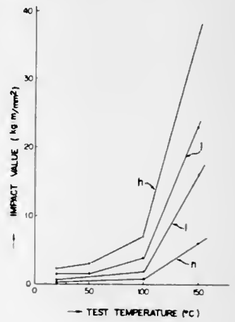
A process is provided for the production of ferrovanadium from slag obtained from vanadium-containing pig iron or other vanadium-containing material, characterized in that the reduction of the slag is carried out in two steps: (1) in the first step a reducing agent is added in such amounts that the substantial portion of the iron oxide in the slag is substantially reduced to metallic iron, whereas practically none of the vanadium oxide is reduced; whereupon after removing the metallic iron from the slag, the fluid vanadium-rich slag is subjected to a further final reduction step (2) by adding a powerful reducing agent thereto, such as Si-rich ferro-silicon in such amounts that the remaining iron oxide in the slag and the major part of the vanadium oxide therein is reduced, and whereby the reducing agent is added gradually under continuous agitation to avoid local concentrations of the reducing material and the thus-obtained ferrovanadium is removed from the slag in a conventional manner.

3,579,329

OXIDATION RESISTANT IRON-CHROMIUM-ALUMINUM ALLOYS

Satoru Mito, Yokohama-shi, Mitsuo Kawai, Tokyo, Hiroshi Yoshida, Yokohama-shi, and Kenichiro Ando, Tokyo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki-shi, Japan

Filed May 12, 1969, Ser. No. 823,778
Int. Cl. C22c *37/10, 39/02*
U.S. Cl. 75—124 **4 Claims**



Heat resistant and oxidation resistant iron-chromium-alumiunm alloys consisting of 15 to 30 percent by weight of chromium, 3 to 7 percent by weight of aluminum, 0.001 to 0.5 percent by weight of one or more of beryllium, magnesium and barium, remainder iron and incidental impurities.

3,579,330

IMAGE-FORMING PROCESS UTILIZING CONTACT ELECTRIFICATION

Robert G. Cunningham, Pittsford, and Harrison P. Hood III, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed May 20, 1968, Ser. No. 730,624
Int. Cl. G03g *13/22*
U.S. Cl. 96—1 **10 Claims**

Electrostatic charge images are produced on a member having an electrically insulating surface when it is intimately contacted with a portion of a second member including originals to be copied that is, at least in part, triboelectrically separated or remote from the insulating surface. After the second member and insulator are separated, a latent electrostatic charge image is present upon the electrically insulating surface in a pattern corresponding to the triboelectrically separated or remote areas of the original that are intimately contacted with the insulating member. This latent image can be rendered visible by electrostatic development techniques. Alternatively, a second member that is uniformly triboelectrically separated can be intimately contacted with an electrically insulating member or surface in an imagewise fashion, thereby producing a latent electrostatic charge image on such insulator in a pattern corresponding to the imagewise contact. This image can also be made visible by electrostatic development.

3,579,331

ELECTROPHOTOGRAPHIC MATERIALS CONTAINING CYANINE DYE SENSITIZERS

John D. Mee and Donald W. Heseltine, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Apr. 8, 1968, Ser. No. 719,690
Int. Cl. G03g *5/02, 5/06*
U.S. Cl. 96—1.6 **26 Claims**

Organic photoconductors are spectrally sensitized with a cyanine dye containing a carbazole nucleus.

3,579,332

SINGLE-CRYSTAL ZINC OXIDE AND AN ELECTROPHOTOGRAPHIC PLATE MADE THEREFROM

Richard Williams, Princeton, N.J., assignor to RCA Corporation

Filed May 27, 1968, Ser. No. 732,326
Int. Cl. G03g *5/00*
U.S. Cl. 96—1.8 **6 Claims**

An improved electrophotographic plate has a photoconductive layer of one or more relatively large wafers of single-crystal, n-type zinc oxide. Each wafer is fixed to, and in electrical contact with, an electrically conductive backing. The novel method of charging the electrophotographic plate comprises (1) wetting a major surface of the zinc oxide layer with a solution of an ionizable salt in a relatively volatile solvent while biasing the solution with a negative voltage with respect to the backing, and (2) allowing the solvent to evaporate, whereby to leave an electrostatic charge on the zinc oxide surface.

3,579,333

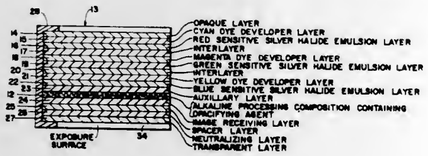
MULTICOLOR DIFFUSION TRANSFER PHOTOGRAPHIC PRODUCTS AND PROCESSES WITH A DEVELOPING COMPOSITION COMPRISING A DESENSITIZING AGENT

Edwin Land, Cambridge, Howard G. Rogers, Weston, and Richard W. Young, Wellesley Hills, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed July 18, 1968, Ser. No. 745,749
Int. Cl. G03c *7/00, 5/54, 5/32*
U.S. Cl. 96—3 **18 Claims**

The present invention relates to a composite photosensitive structure containing, as essential layers, in sequence, a dimensionally stable layer; a photosensitive direct negative silver halide emulsion layer having associated therewith a dye which is a silver halide developing agent and is processing composition soluble and diffusible as a function of the photosensitive silver halide emulsion layer's exposure and a silver halide desensitizing agent adapted to effect, subsequent to photoexposure, desensitization of the photosensitive silver halide emulsion layer without substantial detriment to the latent image carried by the emulsion layer; a polymeric layer dyeable by dye

diffusing thereto; a dimensionally stable layer transparent to actinic radiation; and to specified photographic diffu-



sion transfer processes employing such composite photosensitive structure.

3,579,334

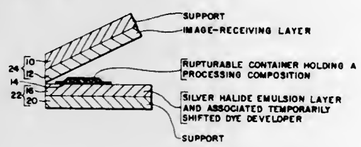
DYE DEVELOPERS WHICH ARE NON-REVERSIBLY SPECTRALLY SHIFTED BY ALKALINE HYDROLYSIS IN COLOR DIFFUSION TRANSFER PROCESSES AND ELEMENTS

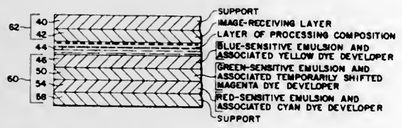
Ronald F. W. Cieciuch, Boston, and Myron S. Simon, Newton Center, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 30, 1968, Ser. No. 756,481

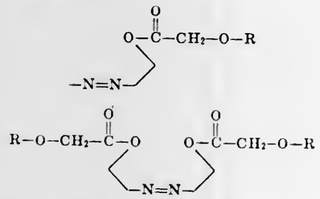
Int. Cl. G03c *5/54, 7/00*

U.S. Cl. 96—29 **13 Claims**

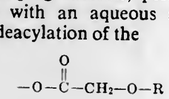




Transfer images in color are formed by exposing a photosensitive element containing a silver halide emulsion and a mono or disazo dye which contains not less than one or more than two groups selected from the group represented by the formulae.



wherein R is a lower alkyl group, said dyes also containing not less than one nor more than two dihydroxyphenyl silver halide developing radicals; permeating the photosensitive element with an aqueous alkaline processing composition, and deacylation of the



groups by hydrolysis to provide hydroxyl groups, thereby providing a non-reversible bathochromic shift of the spectral absorption characteristics of dye; immobilizing the dye as a result of the development of the exposed areas of the emulsion; and transferring, by diffusion, at least a portion of the imagewise distribution of dyes to a superposed image receiving layer to provide a positive dye image therein.

3,579,335

METHOD FOR MANUFACTURING COLOR TELEVISION RECEIVER TUBES

Michio Tamura, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation-in-part of application Ser. No. 540,671, Apr. 6, 1966, now Patent No. 3,437,482. This application Mar. 31, 1967, Ser. No. 627,521

Claims priority, application Japan, Apr. 2, 1966, 41/20,606

Int. Cl. G03c *5/00*

U.S. Cl. 96—36.1 **10 Claims**

A method for manufacturing color television screens for cathode ray tubes comprising the steps of printing a shadow image of a post-deflection-focusing grid on a plate, positioning the optical mask relative to a face plate in accordance with a spurious pattern resulting from light interference, and forming color phosphors on the face plate.

3,579,336

PHOTOCHEMICAL RECORDING PROCESS

Eric Maria Brinckman, Mortsel, Walter August Van den Heuvel, Berchem, and Johan Eugeen Vanhalst, Wilrijk, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Dec. 15, 1967, Ser. No. 690,799

Claims priority, application Great Britain, Dec. 15, 1966, 56,296/66, 56,297/66

Int. Cl. G03c *1/56, 1/58, 1/64*

U.S. Cl. 96—49 **10 Claims**

Process of reproduction using a recording layer containing hexacyanoferrate (III) ions and a substance providing ions of selected metals, preferably an n-type photoconductor. The layer is exposed to an electromagnetic radiation image reducing the hexacyanoferrate (III) ions in the exposed regions to hexacyanoferrate (II) ions. The exposed layer is developed by contacting uniformly with an aqueous developing solution containing a dye intermediate which is oxidizable into a dye. The hexacyanoferrate (III) ions in the unexposed regions oxidize the dye intermediate and are in turn reduced to hexacyanoferrate (II) ions which combine with the metal ions to form a precipitate having a strong affinity for the dye oxidation product. If the exposure is through a positive original, a positive copy is obtained since the image areas of the original shield the corresponding areas of the recording layer from exposure. A layer containing photoconductive zinc oxide is especially preferred.

3,579,337

PHOTOCHEMICAL RECORDING METHOD BY MEANS OF HEXACYANOFERRATE(III)

Eric Maria Brinckman, Mortsel, Johan Eugeen Vanhalst, Wilrijk, and Walter August Van den Heuvel, Berchem, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Dec. 15, 1967, Ser. No. 690,800

Claims priority, application Great Britain, Dec. 15, 1966, 56,294/66, 56,295/66

Int. Cl. G03c *1/52, 1/58, 1/64*

U.S. Cl. 96—49 **12 Claims**

Process of reproduction using a recording layer containing hexacyanoferrate(III) ions and a substance providing ions of selected metals. The layer is exposed to an electromagnetic radiation image reducing the hexacyanoferrate(III) ions to hexacyanoferrate(II) ions which react

with the metal ions to form a precipitate having a strong attraction for a cationic dye. The exposed layer is developed by contracting uniformly with a developing solution containing the cationic dye.

3,579,338

PROCESS FOR MAKING METAL-GLOSSY IMAGES AND PROJECTION USING THE SAME

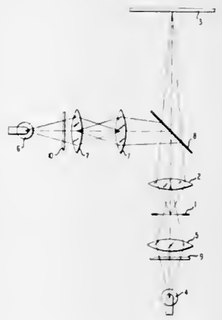
Shingo Ooue and Hiroyuki Ueda, Saitama, and Yoshihide Hayakawa, Ashigara-Kamigun, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 14, 1968, Ser. No. 705,456

Claims priority, application Japan, Feb. 14, 1967, 42/9,421

Int. Cl. G03c *5/26, 5/24;* **G03b** *27/54, 27/76*

U.S. Cl. 96—50 **15 Claims**



A projection process which comprises subjecting a silver halide image to a sulfiding treatment, treating the image thus treated with a solution containing a solvent for silver halide to provide a metal-glossy image, applying to the surface of the metal-glossy image an illuminating light beam for transmission and an illuminating light beam for reflection, combining the penetrating light beam and the reflected light beam, and projecting on a screen the combined light beam to provide a projected image having various contrasts. A process for making a metal-glossy image which comprises subjecting a silver halide image to a sulfiding treatment and then treating the image thus treated with a solution containing a solvent for silver halide.

3,579,339

PHOTOPOLYMERIZABLE DISPERSIONS AND ELEMENTS CONTAINING NONMIGRATORY PHOTOREDUCIBLE DYES

Catherine Teh-lin Chang, New Brunswick, and Peter Walker, Red Bank, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed May 23, 1967, Ser. No. 640,496

Int. Cl. G03c *1/76, 3/00, 1/68*

U.S. Cl. 96—74 **12 Claims**

A photopolymerizable dispersion and layers comprising a continuous phase with an oragnic macromolecular polymer dispersion medium (e.g., gelatin) and a dispersed phase including an addition polymerizable ethylenically unsaturated compound (e.g., a monomer such as pentaerythritol triacrylate, and at least one of the ingredients of a color image-yielding composition (e.g., a photographic color former) in reactive association with a photoinitiator mixture comprising (a) a nonmigratory, photoreducible dye, e.g., Methylene Blue having the four methyl radicals replaced by butyl radicals, and (b) a free-radical producing agent, e.g., N-phenylglycine.

3,579,340

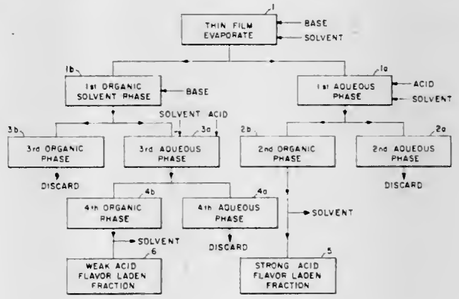
ISOLATING ACIDIC MATERIALS FROM A THIN FILM EVAPORATE

Rudolf G. K. Strobel, Colerain Township, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 8, 1969, Ser. No. 822,943

Int. Cl. A23f *1/08, 1/04*

U.S. Cl. 99—71 **17 Claims**



Coffee flavor present in a thin film evaporate consists of both beneficial and detrimental flavor constituents. Disclosed is a process of separating beneficial constituents frome detrimental constitutents by an acid/base liquid/liquid extraction process. The thin film evaporate is separated into acid fractions, a basic fraction and a neutral fraction. The basic and neutral fractions are detrimental and are discarded. The acidic fractions are beneficial and are added back to dry soluble coffee to provide improved flavor.

3,579,341

PULPY TEXTURED FOOD SYSTEMS CONTAINING INHIBITED STARCHES

Paolo C. Trubiano, Somerville, and Nicholas G. Marotta, Green Brook, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

No Drawing. Filed May 7, 1969, Ser. No. 822,722

Int. Cl. A23l *1/00, 1/10, 1/40*

U.S. Cl. 99—83 **5 Claims**

A method for the preparation of starch containing food products exhibiting a grainy, pulpy texture, as well as the food products thus prepared, said method comprising the step of admixing the non-starch ingredients of said food product with an amylose-containing starch product which has been inhibited by reaction with a crosslinking agent, then precooked, gelatinized, and pulverized to within a certain particle size range, and thereafter heating the resulting mixture at a temperature of at least about 160° F. so as to effect the swelling of the starch particles therein.

3,579,342

LEUCO TRIARYLMETHANE/HEXAARYLBIIMIDAZOLE COLOR FORMING SYSTEM CONTAINING A DEACTIVATOR

Peter S. Strilko, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed June 27, 1968, Ser. No. 740,476

Int. Cl. G03c *1/72*

U.S. Cl. 96—90 **14 Claims**

A photoimagable and photodeactivatable composition of

(A) A salt of a leuco triarylmethane and a salt-forming acid;

(B) A hexaarylbiimidazole which absorbs principally in the ultraviolet region and is a photooxidant for the salt

of the leuco triarylmethane present in an amount of from about 1 to 2 moles per mole of said salt of the leuco triarylmethane;

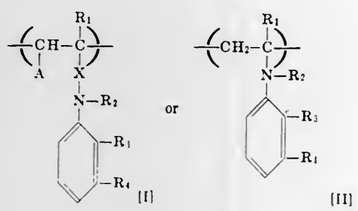
(C) 1,6-pyrenequinone or 1,8-pyrenequinone or both, present in an amount of from about .04 to .4 mole per mole of hexaarylbiimidazole;

(D) A visible light-absorbing carbonyl compound selected from 9,10-phenanthrenequinone, perinaphthenone, or 4-methoxy-1,2-naphthoquinone; present in an amount of from about .05 to 2 moles per mole of hexaarylbiimidazole; and

(E) An ether containing at least one oxymethylene group wherein the methylene bears at least one hydrogen; present in an amount providing from about 50 to 500 oxymethylene groups per mole of the combined quinone components (C) and (D).

3,579,343
PHOTORESIST-FORMING COMPOSITIONS
Motoo Kogure and Shoichiro Hoshino, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd.
No Drawing. Filed Apr. 16, 1968, Ser. No. 721,621
Claims priority, application Japan, Apr. 25, 1967, 42/25,988
Int. Cl. G03c *1/70, 1/72*
U.S. Cl. 96—90R **2 Claims**

A photoresist-forming composition comprising a photo activator having a polychlorinated or polybrominated methyl group capable of forming a free radical by the action of light and a homopolymer or a co-polymer with other vinyl monomer, of a monomer represented by the general formula



[I] [II]

wherein A is a hydrogen atom, a carboxylic acid or carboxylic acid amide; X is $—COOCH_2CH_2—$,

$$—CONHCH_2CH_2—$$

$—COSCH_2CH_2$, —CONH—, $—CH_2—$, $—\phi SO_2NH—$, $—\phi SO_2O\phi—$, $—CONH\phi—$; R_1 is a hydrogen atom or a lower alkyl group: R_2 is a hydrogen atom, a lower alkyl group or a substituted or unsubstituted phenyl group; and R_3 and R_4 are individually a hydrogen atom or a lower alkyl group, provided that in the case of the Formula II, R_2 and R_3 may form a heterocyclic ring together with nitrogen and the benzene ring, and R_3 and R_4 may form a naphthalene ring together with the benzene ring.

3,579,344
NOVEL DYES AND DIRECT POSITIVE PHOTOGRAPHIC EMULSIONS
Frank G. Webster, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Sept. 8, 1967, Ser. No. 666,512
Int. Cl. G03c *1/08*
U.S. Cl. 96—139 **18 Claims**

Novel merocyanine and oxonol dyes are provided which feature a 3-arylamino or a 3-lower fatty acid amido substituted 2-pyrazolin-5-one nucleus. Merocyanine dye salts of the invention sensitize direct positive photographic silver halide emulsions.

3,579,345
DIRECT POSITIVE EMULSIONS SENSITIZED WITH PYRYLIUM AND/OR THIAPYRLIUM SALTS
Jean E. Jones, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Continuation-in-part of abandoned application Ser. No. 609,762, Jan. 17, 1967. This application Oct. 2, 1967, Ser. No. 671,971
Int. Cl. G03c *1/08, 1/28*
U.S. Cl. 96—102 **19 Claims**

Pyrylium, thiapyrylium or selenapyrylium salts are incorporated in direct positive photographic silver halide emulsions.

3,579,346
SILVER HALIDE EMULSIONS WITH DYES CONTAINING A PYRYLIUM NUCLEUS JOINED TO A PYRAZOLE NUCLEUS
Leslie G. S. Brooker, Donald W. Heseltine, and Daniel S. Daniel, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Mar. 25, 1968, Ser. No. 715,530
Int. Cl. G03c *1/10;* **C09b** *23/10*
U.S. Cl. 96—106 **32 Claims**

Novel photographic methine dyes are provided which feature a pyrylium nucleus joined, by a methine chain, to a pyrazole nucleus or a nitro substituted nucleus of the type used in cyanine dyes. Light sensitive silver halide emulsions are also provided comprising the novel dyes of this invention.

3,579,347
SILVER HALIDE EMULSION CONTAINING WATER-SOLUBLE POLYMER
Henry Walter Wood, Ilford, England, assignor to Ilford Limited, Ilford, Essex, England
No Drawing. Filed June 10, 1969, Ser. No. 832,021
Claims priority, application Great Britain, Jnne 14, 1968, 28,394/68
Int. Cl. G03c *1/28, 1/72*
U.S. Cl. 96—114 **6 Claims**

This application describes photographic material which comprises a gelatino silver halide emulsion layer the photographic material being characterised in that there is present in the said emulsion layer or in a layer in operative contact with the said emulsion layer a water-soluble homopolymer of a compound of the general formula:

$$(CH_2{=}CH{—}CH_2)_2NR_1R_2{+}X^-$$

where R_1 and R_2 are each hydrogen atoms or alkyl groups and X is an anion, or a water-soluble copolymer thereof with minor amounts of other ethylenically unsaturated monomers.

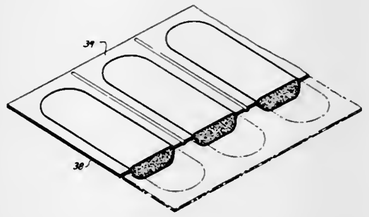
3,579,348
DIRECT-PRINT SILVER HALIDE EMULSIONS
Delbert Dale Fix and Richard Warren Karlson, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Oct. 21, 1966, Ser. No. 588,342
Int. Cl. G03c *1/08, 1/10, 1/28*
U.S. Cl. 96—126 **14 Claims**

Direct-print silver halide emulsions comprising the combination of a urazole halogen acceptor and a merocyanine dye having carboxy-containing substituents thereon provide improved photographic systems having better image properties such as, for example, improved image discrimination upon storage.

3,579,349
PREPARATION OF CHOCOLATE EXTRACT
Abraham R. Mishkin, Richard D. Martin, and Joseph L. Ohler, Marysville, Ohio, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland
No Drawing. Filed Aug. 19, 1968, Ser. No. 753,779
Int. Cl. A23g *1/00*
U.S. Cl. 99—23 **7 Claims**

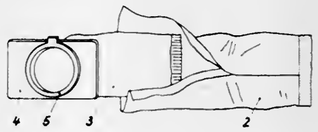
A chocolate extract is prepared by steam-stripping a mixture of water and cocoa liquor to remove and recover aromatic constituents, heating the stripped mixture, separating the aqueous phase containing the water-soluble constituents and adding the recovered aromatics.

3,579,350
BEVERAGE TAPE
Lloyd K. Rudd, Berwyn, and George R. Schollhamer, Philadelphia, Pa., assignors to Rudd-Melikian, Inc., Warminster, Pa.
Filed Apr. 7, 1967, Ser. No. 629,138
Int. Cl. B65b *29/02*
U.S. Cl. 99—77.1 **4 Claims**



Beverage tape consisting of a pair of water permeable strips encapsulating within cavities pods of beverage material. The cavities are interconnected by flat web portions and are located within one of the strips so that substantially all of the beverage material is positioned on one side of the web. The pods are of elongated plan shape with its major axis extending transversely to the length of the strips. The pods act to self-position the tape within a brewing machine.

3,579,351
COFFEE POWDER PACKAGE
Hans Wege, Hanau-Hohe Tanne, and Eric Gast, Frankfurt, Germany, assignors to Firm Wilhelm Kuhn, Hanau, Germany
Filed Jan. 17, 1969, Ser. No. 791,980
Claims priority, application Germany, Aug. 5, 1968, K 61,973
Int. Cl. B65d *65/00*
U.S. Cl. 99—77.1 **1 Claim**



A filter paper bag has an open top end and is partly filled with coffee powder. A flanged plate is secured to said open top end and laterally outwardly protrudes therefrom and is formed with an aperture which communicates with the interior of said bag. A cover closes the aperture. The filter paper bag is entirely enclosed by an aroma-tight wrapper bag.

3,579,352
EXTRUDER-COOKED CEREAL ENDOSPERM PARTICLES AND INSTANT BEVERAGE MIXES COMPRISING THE SAME
George N. Bookwalter, Peoria, Howard F. Conway, Pekin, and Edward L. Griffin, Jr., Peoria, Ill., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed Oct. 31, 1968, Ser. No. 772,380
Int. Cl. A23l *1/00, 1/10*
U.S. Cl. 99—78 **4 Claims**

Cereal grain endosperms having a moisture content of 10–20% are heated at 325–400° F. in a screw-type extruder at a pressure of 2000–4000 p.s.i. The ejected material is milled to provide a cold water soluble product which is combined with soybean flour, nonfat dry milk solids, sugar, salt, minerals and vitamins to form an instant beverage mix.

3,579,353
FOOD PRODUCTS CONTAINING ALKYL-SUBSTITUTED PYRAZINES
Gunther M. Nakel and Brinton Marlo Dirks, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Oct. 23, 1967, Ser. No. 677,030
Int. Cl. A23l *1/18, 1/22*
U.S. Cl. 99—81 **4 Claims**

Food products are made more flavorful by adding 0.15–10,000 p.p.m. of alkyl-substituted pyrazines, especially those having molecular weight less than 140.

3,579,354
PREPARATION OF AN ELASTIC CHEESE PRODUCT
Robert L. Kasik and Anthony J. Luksas, Chicago, Ill., assignors to Beatrice Foods Co., Chicago, Ill.
No Drawing. Filed Aug. 1, 1968, Ser. No. 749,309
Int. Cl. A23c *19/02*
U.S. Cl. 99—116 **12 Claims**

An elastic cheese product is made by inoculating sodium caseinate containing butterfat with lactic acid organisms in aqueous medium, then inoculating with a micrococcus, fermenting aerobically until the system becomes elastic and plastic, then acidifying the pH 4.5 and drying.

A bland product can be prepared by growing trained *Streptococcus lactis* and/or micrococci on aqueous sodium caseinate, acidifying, removing the liquid, resuspending with aid of alkali to pH 6–7 and drying.

3,579,355
MULTILAYERED GELATIN CONTAINING DESSERTS
Clement R. Wyss, Scarsdale, Robert Cassanelli, Yorktown Heights, and Joseph Russo, Irvington, N.Y., assignors to General Foods Corporation, White Plains, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 783,738, Dec. 13, 1968. This application Oct. 22, 1969, Ser. No. 868,578
Int. Cl. A23l *1/04*
U.S. Cl. 99—130 **8 Claims**

Dry composition comprising a combination of gelatin and fat, sugar and an emulsifier for the fat which upon successive whipping with water at various temperatures produces a 2 or 3 layered multitextured gelatin dessert when the product cools.

3,579,356

TITANIUM DIOXIDE WHITENED COMESTIBLE COMPOSITIONS

Donald E. Miller, Oak Park, and Cecelia R. Gilmore, Oak Lawn, Ill., assignors to SCM Corporation, Cleveland, Ohio

No Drawing. Filed Apr. 24, 1968, Ser. No. 723,920

Int. Cl. A23l *1/27*

U.S. Cl. 99—148 **8 Claims**

Compositions comprising comestible base and a blend of TiO_2, and an edible organic nitrogen-containing, sulfur containing, or sulfur and nitrogen containing edible organic compound are described.

The compositions are advantageous in that they make possible comestible products of enhanced whiteness or lightness of color. The compositions are further advantageous in that TiO_2 which is a relatively dense material does not settle but remains dispersed in the compositions.

3,579,357

FOODSTUFFS CONTAINING AN ANTIOXIDANT

Hirotoshi Samejima, Machida-shi, Tokyo-to, Kiyoshi Nakayama, Sagamihara-shi, and Yuji Nagano, Machida-shi, Tokyo-to, Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Jan. 15, 1968, Ser. No. 697,771

Claims priority, application Japan, Jan. 16, 1967, 42/2,731

Int. Cl. A23b *7/00;* **A23l** *3/34*

U.S. Cl. 99—154 **3 Claims**

There are provided compositions comprising at least one substance susceptible to oxidation by atmospheric air and a compound of the formula

$$R—S—(CH_2)_n—NH_2$$

wherein R represents a hydrogen atom or a lower alkyl group and n is 2 or 3. The oxidation of the substance is greatly inhibited.

3,579,358

METHOD OF PREPARING AN EDIBLE TUBULAR COLLAGEN CASING

Albert Courts, Solihull, England, assignor to Lever Brothers Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 810,917, Mar. 24, 1969, which is a continuation of application Ser. No. 463,021, June 10, 1965. This application Nov. 26, 1969, Ser. No. 880,436

Int. Cl. A22c *13/00*

U.S. Cl. 99—176 **31 Claims**

Collagen is chemically modified by treatment with a strong alkali in the presence of an alkali metal salt capable of preventing swelling of the collagen. The collagen is then swollen and formed into a dough and is extruded into a precipitating bath to form a tubular casing, particularly a sausage casing.

3,579,359

METHOD FOR PRODUCTION OF DEEP FROZEN FISH PRODUCTS

Eiler Schjolberg, Reinslettveien 32, Bodo, Norway

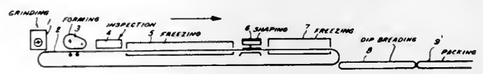
Filed Mar. 26, 1968, Ser. No. 716,055

Claims priority, application Norway, Apr. 5, 1967, 167,593

Int. Cl. A23b *3/00, 3/06*

U.S. Cl. 99—195 **3 Claims**

The invention relates to a method for production of foodstuffs in the form of deep frozen, shaped products, for example, the so-called fish sticks, grill fingers, breaded portions and similar substantially processed products, produced from fish or other raw materials, in which the raw material is ground to a mass consisting of grain size particles, formed into a band-like product and frozen to a consistency and temperature suitable for portioning, whereafter portioning into shaped portions is carried out



and the said products are further frozen to the desired keeping temperature.

3,579,360

LYOPHILISING A CARBON DIOXIDE SOLUTION

Louis René Rey, St.-Legier, Switzerland, Monick Dousset, Paris, France, and Françoise Chauffard, Vevey, Switzerland, assignors to Societe d'Assistance Technique pour Produits Nestle S.A.

No Drawing. Filed July 6, 1967, Ser. No. 651,378

Claims priority, application Switzerland, July 8, 1966, 10,054

Int. Cl. A23f *1/06;* **F26b** *5/06*

U.S. Cl. 99—199 **5 Claims**

Porous composite materials, consisting of a continuous phase and a disperse phase in intimate association with the continuous phase may be obtained by the application of freeze-drying techniques. The materials may be prepared either by freeze-drying a first solution, impregnating the dry material with a second solution and again freeze-drying, or by freeze-drying a system consisting of two solutes dissolved in different solvents which may be immiscible. Freeze-drying of both aqueous and non-aqueous systems is envisaged.

3,579,361

VISCOUS LIQUID MATERIAL AND PROCESS FOR MAKING SAME

Joseph E. Blaze, Jr., Beaver, Pa., assignor to The Babcock & Wilcox Company, New York, N.Y.

No Drawing. Filed Apr. 22, 1969, Ser. No. 818,446

Int. Cl. C09d *5/08*

U.S. Cl. 106—14 **2 Claims**

A viscous liquid material prepared by adding acetic acid to an aqueous solution containing aluminum chloride and a solidification inhibitor acid, and then concentrating the resultant solution at a temperature below its boiling point until it attains a selected viscosity within the range 2 to 20 poises. The inhibitor acid can be either boric acid, phosphoric acid or a mixture of both these acids. Colloidal silica can be added to the solution before final concentration to make a product containing dispersed silica.

3,579,362

DIELECTRIC $3NiO \cdot X_2O_3 \cdot 6TiO_2$ COMPOSITIONS

Russell G. West, Alexandria, Va. (% Trans-Tech, Inc., 12 Meem Ave., Gaithersburg, Md. 20760)

No Drawing. Filed Oct. 20, 1969, Ser. No. 867,910

Int. Cl. C04b *33/00*

U.S. Cl. 106—39 **7 Claims**

The ceramic dielectric composition of about 30 mole percent NiO, about 10 mole percent of Al_2O_3, Fe_2O_3 or mixtures thereof, and about 60 mole percent TiO_2 is disclosed. The composition is a high dielectric constant value, stable, passive, low loss dielectric medium which may be used in microwave device applications.

3,579,363

PLASTICIZED RESIN COMPOSITIONS

James K. Sears, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 19, 1968, Ser. No. 777,165

Int. Cl. C08b *27/52*

U.S. Cl. 106—176 **23 Claims**

This invention relates to the use of certain phthalimidoacetates as plasticizers for thermoplastic resins.

3,579,364

PLASTICIZED RESIN COMPOSITIONS

James K. Sears, Webster Groves, Mo., assignor to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Nov. 21, 1968, Ser. No. 777,913

Int. Cl. C08b *27/52*

U.S. Cl. 106—176 **21 Claims**

This invention relates to the use of certain bisphthalimidoacetates as plasticizers for thermoplastic resins.

3,579,365

COMPOSITIONS FOR AND METHODS OF IMPROVING ADHESION OF PLATED METAL ON PLASTIC SUBSTRATES

John J. Grunwald, New Haven, and Eugene D. D'Ottavio, Thomaston, Conn., assignors to MacDermid Incorporated, Waterbury, Conn.

No Drawing. Filed June 14, 1967, Ser. No. 645,901

Int. Cl. C08h *9/00;* **B01j** *13/00*

U.S. Cl. 106—265 **8 Claims**

A method of and composition for promoting adhesion between plated metal and a plastic substrate, in which the active agent is provided in finely divided dispersed or colloidal aqueous emulsion form. The active agents are any of a group of low molecular weight organic unsaturated compounds of the fatty acid type, and more especially of the group of naturally occurring products such as linseed, tall, tung and castor oils, turpentine and similar wood rosins. These, when dispersed in water to provide stable emulsions, are used as a pretreatment bath for plastic substrates, prior to plating of the substrate, in order to promote the formation of a stronger bond between the metal plate and substrate.

3,579,366

GRANULATED ADDITIVE, METHOD OF MAKING THE SAME, AND CEMENTITIOUS GROUT AND CONCRETE COMPOSITIONS CONTAINING THE SAME

Solomon J. Rehmar, East Cleveland, Ohio, assignor to Intrusion-Prepakt, Cleveland, Ohio

No Drawing. Filed July 12, 1968, Ser. No. 744,303

Int. Cl. C04b *21/02, 31/40*

U.S. Cl. 106—314 **6 Claims**

As an additive for cementitious grout and concrete, a porous granule characterized by a skeletal structure and a network of interstitial voids formed by in situ gas liberation, the skeletal structure consisting essentially of a dispersion of finely divided, substantially oxide free aluminum particles in a matrix formed of a powdered inorganic extender and a water soluble binder which is inert with respect to the aluminum particles.

3,579,367

METHOD OF METALLIZING A LUMINESCENT SCREEN

Himanshu M. Patel, Pine City, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 22, 1968, Ser. No. 778,260

Int. Cl. H01j *31/20*

U.S. Cl. 117—33.5 **3 Claims**

This invention relates to luminescent screens and to the application of a metallic backing layer thereon. More particularly, this invention describes a method of depositing a double coating of an organic heat removable material over the phosphor in the luminescent screen for the purpose of providing a smooth substrate upon which the metallic backing layer may be deposited.

3,579,368

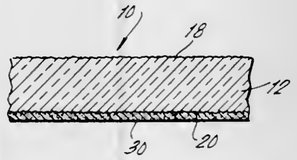
SIMULATED SLATE AND METHOD FOR MAKING THE SAME

Eugene Bleiweiss, Maywood, N.J., assignor to Metaframe Corporation

Filed July 1, 1968, Ser. No. 741,487

Int. Cl. C03c *17/00*

U.S. Cl. 117—54 **12 Claims**



Simulated slate, particularly suitable for use as an aquarium bottom, made by subjecting both sides of a sheet of glass to treatment which will render said sides in a nonsmooth or discontinuous surface, and thence applying an opaque coating to one of the discontinuous surfaces thereof.

3,579,369

WOOD MEMBERS IMPREGNATED WITH SYNTHETIC ORGANIC RESINS AND METHOD OF PRODUCING SUCH IMPREGNATED MEMBERS

Newton C. Foster, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

No Drawing. Filed June 26, 1968, Ser. No. 740,098

Int. Cl. B44d *1/28;* **B27k** *3/36*

U.S. Cl. 117—57 **9 Claims**

A method of making a synthetic organic resin impregnated wood member wherein the wood is pretreated with an activator, such as dimethyl aniline, in the vapor phase. A synthetic organic liquid resinous composition containing, for example, styrene and an unsaturated polyester catalyzed with benzoyl peroxide is then impregnated into the wood at about room temperature causing the resin to polymerize within the wood.

3,579,370

COMPOSITE LAYERED TETRAHALOETHYLENE STRUCTURE

John Oliver Punderson and Miguel Jacinto Roura, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of abandoned application Ser. No. 687,691, Dec. 4, 1967. This application Oct. 1, 1969, Ser. No. 862,829

Int. Cl. B32b *27/08*

U.S. Cl. 117—72 **13 Claims**

A coating is provided which is self-adherent to a surface of tetrahaloethylene polymer, e.g., polytetrafluoroethylene, to make the polymer surface either more print-

able or to serve as an adhesive for a coating, e.g., polyvinylidene fluoride, which protects the polymer surface. In one embodiment, the coating comprises a blend of 10 to 90 percent by weight of a copolymer of tetrafluorethylene hexafluoropropylene and the remainder, to total 100 percent, of polyvinylidene fluoride.

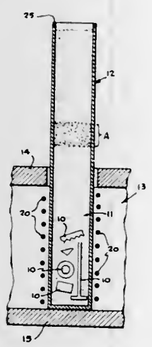
3,579,371
BARRIER STRUCTURE FOR PACKAGING PURPOSES
Joseph A. Dooley, Cedar Grove, and Michael J. Gnozzio, Lincoln Park, N.J., assignors to Inmount Corporation
No Drawing. Filed May 22, 1968, Ser. No. 731,319
Int. Cl. B32b *29/06, 23/08;* **B44d** *1/14*
U.S. Cl. 117—76 **3 Claims**

A packaging structure comprising a cellulosic substrate carrying a subcoating of a polyvinylidene chloride resin and a topcoating consisting of a blend of an alkyd resin and an amine-aldehyde resin.

3,579,372
DEPOSITION OF MICROPOROUS FILM EMPLOYING DIELECTRIC HEATING
Lawrence W. Healy, Glen Rock, N.J., assignor to Genset Corporation, Newark, N.J.
Filed Dec. 4, 1968, Ser. No. 780,987
Int. Cl. B44d *1/50, 1/092*
U.S. Cl. 117—93.1 **6 Claims**

Describes procedure for deposition of microporous grain layer in and on a substrate for the production of leather replacement products in which a substrate which is coated with a solution of a polymer and wetted with water is exposed to dielectric heating to vaporize the water. The vapors mix with the organic solution and effect deposition of the polymer.

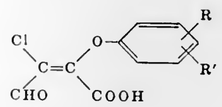
3,579,373
CARBIDING
Vernon J. Pingel, 812 W. Grove St., Arlington Heights, Ill. 60005
Filed Oct. 18, 1968, Ser. No. 768,836
Int. Cl. C23c *11/08*
U.S. Cl. 117—106 **4 Claims**



A method of applying a carbide coating to a surface of an article having 0.5% or more carbon which includes imbedding the article in a packed bed which has an upper portion at a lower temperature and in communication with the atmosphere, the condensible volatiles moving from the high temperature lower portion condense in the upper portion and are prevented from being moved into the atmosphere. The ingredients of the pack include an antifusing agent, a metal source component, halide of the metal source component, and barium chloride.

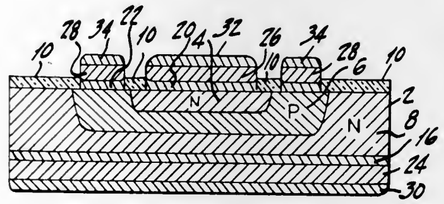
3,579,374
SHEET SUPPORTED ARTICLES COATED WITH HEAT-ACTIVABLE TANNING AGENTS AND IMPROVED METHODS OF HARDENING SAID ARTICLES AND RELATED COMPOSITIONS
René Jean Dennilauler, Maurice Edgar Pfaff, and Pierre Amédée Roman, Vincennes, France, assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed June 26, 1967, Ser. No. 649,435
Claims priority, application France, June 28, 1966, 67,164
Int. Cl. C09d *3/04;* **C08h** *17/62*
U.S. Cl. 117—164 **16 Claims**

Tanning (hardening) agents in a colloid layer of gelatin or the like are inactive at ordinary temperatures but are activated at temperatures above 70° C. to rapidly tan the colloid in which they are incorporated. Suggested uses are in thermography and photography. Specific examples describe various gelatin layers containing the heat-activated hardeners. The class of useful tanning agents is described by the formula



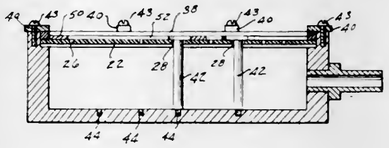
wherein the substituents R and R′ are selected from hydrogen and halogen atoms and alkyl, carboxyl, alkoxy, formyl, tertiary amino and sulfo radicals. Some specific new compounds of this class are described.

3,579,375
METHOD OF MAKING OHMIC CONTACT TO SEMICONDUCTOR DEVICES
Edmund Wonilowicz, Englishtown, and Henry F. Machnacz, Somerville, N.J., assignors to RCA Corporation
Filed Oct. 18, 1968, Ser. No. 768,719
Int. Cl. B44d *1/14*
U.S. Cl. 117—212 **4 Claims**



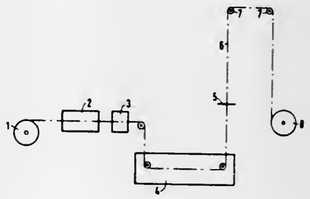
A method of making ohmic contacts to a semiconductor device wherein aluminum is deposited on at least one of several contact areas on the semiconductor body, nickel is deposited electrolessly simultaneously on the aluminum layer and on a contact area not covered with aluminum, the nickel layer being built up in a series of separate depositions, the nickel is sintered after each deposition and solder is finally deposited on all the nickel surfaces.

3,579,376
METHOD OF FORMING A RESIST PATTERN ON A CIRCUIT BOARD OR THE LIKE
George E. Vincent, Jr., Bethel, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed July 23, 1968, Ser. No. 746,951
Int. Cl. H05k *3/00*
U.S. Cl. 117—212 **5 Claims**



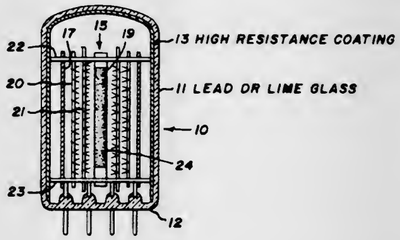
A method of applying a resist coating to the surface of a circuit board or the like having a plurality of holes therethrough in which the board is assembled over an opening in a pressurized fixture with the periphery of the board in fluidtight relationship with the periphery of the opening to cause the pressurizing fluid to flow through the holes and outwardly of the exposed surface of the board. Under these conditions, a coating of resist is applied to the exposed surface in any suitable manner known to the art with the fluid flowing through the holes preventing the flow of resist into the holes and keeping the holes open. At locations at which the board has relatively large holes, posts or pins on the fixture extend upwardly through the central portions of the openings to the surface of the board, the size of the posts being such as to fill the centers of the holes while leaving annular spaces therearound for the flow of fluid.

3,579,377
METHOD OF PRODUCING TIN OR TIN-ALLOY COATED COPPER JUMP WIRE BY MEANS OF HOT METALIZING
Horst Schreiner, Nuremberg, and Helmut Ohmann, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed Apr. 25, 1968, Ser. No. 724,012
Claims priority, application Germany, Apr. 29, 1967, S 109,665
Int. Cl. B44d *1/44;* **C23c** *1/04*
U.S. Cl. 117—217 **7 Claims**



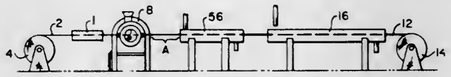
Described is a method of producing copper wire, uniformly coated around its periphery with tin or a predominantly tin-containing alloy, by hot metalizing. In this method a scraping die is placed at such a distance from the surface of the bath of tin or a predominantly tin-containing alloy, that the scraping die is positioned just within the solidification range of the bath component.

3,579,378
METHOD OF COATING AN ELECTRIC DISCHARGE DEVICE
Walter T. Millis, Owensboro, Ky., assignor to General Electric Company
Division of application Ser. No. 531,082, Mar. 2, 1966, now Patent No. 3,465,196. Continuation-in-part of application Ser. No. 302,490, Aug. 9, 1963. This application Nov. 12, 1968, Ser. No. 798,830
Int. Cl. C23d *5/04*
U.S. Cl. 117—229 **1 Claim**



A method of making an electric discharge device having a vitreous coating on the interior of the envelope is described. The vitreous coating inhibits the release of occluded gases from the envelope which upon release would adversely affect the operation and life of the device.

3,579,379
PROCESS FOR PRODUCING CONDUCTORS INSULATED WITH POLYETHYLENE TERPHTHALATE
Franciscus C. A. A. van Berkel, 8 Deerfield Road, Asheville, N.C., and Stanley F. Luques, Lakeview Drive, Columbia, Conn.
Filed Dec. 1, 1966, Ser. No. 598,276
Int. Cl. B44d *1/09, 1/18;* **C09d** *3/48*
U.S. Cl. 117—232 **8 Claims**

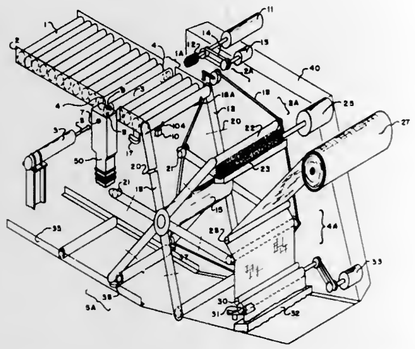


Process for producing insulated electrical conductors comprising applying a coating of polymeric ethylene terephthalate to electrical conductors, the improvement comprising (1) utilizing molten polyethylene terephthalate having an initial relative viscosity of at least 1.80 and containing from 0.01 to 5% by weight of a liquid crystallization promoting compound, (2) followed by cooling the coating and then (3) heating the cooled coating to a temperature of at least 100° C. to effect a crystallization of at least 15% in said polymeric coating. In the practice of this process, lengthy injection molding cycles and/or unduly long cooling cycles are avoided.

3,579,380
PROCESS FOR THE PRODUCTION OF XYLOSE SOLUTIONS
Hermann Friese, Hamburg, Germany, assignor to Sud-Chemie AG, Munich, Germany
No Drawing. Filed Dec. 4, 1969, Ser. No. 882,318
Int. Cl. C13k *9/00*
U.S. Cl. 127—37 **7 Claims**

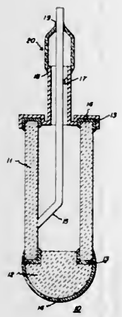
Xylose solutions free from crystallization-inhibiting substances are obtained, without any pre-treatment steps, from stone fruit shells such as of coconut, walnut and apricot, peach or plum pits by hydrolysis with aqueous mineral acids followed by separation from undissolved reaction residue and decolorizing.

3,579,381
AUTOMATIC BOBBIN AND PIRN CLEANING
Lawrence L. Bailey and Donel C. Autin, Columbia, S.C., assignors to Allied Chemical Corporation, New York, N.Y.
Filed Oct. 25, 1968, Ser. No. 770,557
Int. Cl. B08b *1/02*
U.S. Cl. 134—8 **15 Claims**



An improved method and apparatus for cleaning textile bobbins or pirns involving the steps of removal of merge disc, removal of metallic scale or dust from the core, and cleaning and drying of the exterior for surface of the bobbin or pirn as an automated combined operation wherein the sequence of continuous feed, merge disc removal, dry core cleaning and loading and discharge of the pirn or bobbin surface after cleaning and drying is an automatic, continuous and high-speed operation which is adapted to clean bobbins and pirns with a range of internal and external diameters and lengths.

3,579,382
SEALED CONTAINER FOR ELEMENTAL SODIUM
Harold A. Christopher, Scotia, N.Y., assignor to General Electric Company
Filed Mar. 27, 1969, Ser. No. 811,014
Int. Cl. H01m *35/02*
U.S. Cl. 136—20 **2 Claims**



An evacuated, sealed container for pure elemental sodium is disclosed which has an open-ended casing of an ionic conducting material sealed at one end with a high temperature ceramic plug by means of a high melting point sodium resistant glass, an electronic conductor in contact with the interior surface of the ionic conducting material and extending outwardly from the casing, and a seal at the other end of the casing. Such a container provides a suitable device for storing and dispensing pure elemental sodium, or provides a sodium electrode with an associated ionic conducting electrolyte. Methods are also described for forming evacuated, sealed containers for pure elemental sodium.

3,579,383
PROCESS FOR ACTIVATING METAL FOIL FOR USE AS A POSITIVE ELECTRODE IN ALKALINE STORAGE BATTERIES
Trevor Stanley Turner, Kidderminster, England, assignor to The International Nickel Company, Inc., New York, N.Y.
No Drawing. Filed July 16, 1969, Ser. No. 842,347
Claims priority, application Great Britain, Aug. 2, 1968, 37,995/68; Apr. 3, 1969, 17,617/69
Int. Cl. H01m *35/30, 43/04*
U.S. Cl. 136—76 **9 Claims**

Process for activating a metal surface, e.g., nickel foil, for use as the positive electrodes in alkaline storage batteries, in which the foil is immersed in a bath containing a nickel ammine complex and then made the anode in an electrolytic treatment during which current is passed through the bath to deposit the battery active mass on the metal. A high capacity activated metal foil is also disclosed.

3,579,384
ELECTRIC CURRENT-PRODUCING CELLS
Sandors G. Abens, Philadelphia, Pa., assignor to Honeywell Inc., Minneapolis, Minn.
No Drawing. Filed Mar. 19, 1969, Ser. No. 808,650
Int. Cl. H01m *17/02*
U.S. Cl. 136—100 **6 Claims**

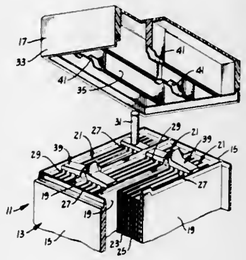
An improved current-producing cell system wherein the electrolyte comprises a solution of lithium-hexofluoroarsenate in methyl formate and the cathode is copper fluoride. The novel cell consists essentially of a lithium metal anode, a copper fluoride cathode, and an electrolyte solution of lithium-hexofluoroarsenate in methyl formate.

3,579,385
METHOD OF IMPREGNATING METALLIC FIBER BATTERY ELECTRODES
William Feduska, Edgeworth, and Jack T. Brown, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Continuation of application Ser. No. 764,461, Oct. 2, 1968. This application Apr. 13, 1970, Ser. No. 28,179
Int. Cl. H01m *35/30, 43/04*
U.S. Cl. 136—75 **6 Claims**

A method of loading active material into flexible, bonded, metallic fiber, porous battery plaques, by a plurality of molten salt impregnation and electrolysis steps, for use as positive and negative electrodes in cells and batteries, wherein the active material is conditioned by an intermediate charging and/or intermediate charging and discharging formation step. The conditioning step is between the loading steps and causes the active material, precipitated during electrolysis, to compact against and between the flexible metal fibers, opening the pores of the plaque and allowing additional loading at a high rate in subsequent impregnation-electrolysis steps.

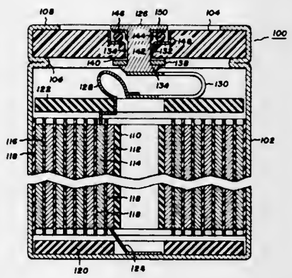
3,579,386
INTERCELL CONNECTORS IN BATTERIES AND METHOD OF FORMING SAME
Ernest G. Tiegel, Redwood City, and Ralph G. Tiegel, San Carlos, Calif., assignors to Tiegel Manufacturing Co., Belmont, Calif.
Filed Oct. 22, 1965, Ser. No. 501,037
Int. Cl. H01m *13/10*
U.S. Cl. 136—134 **16 Claims**

Leakproof electric stroage battery intercell connectors passing through the cell divider wall, and method and apparatus for forming such connectors by a cast-on process while the plates are in place in the cells of the battery. The connector is slotted in its lower surface to mate with the upper surface of the divider wall and ridged on its upper surface to mate with a corresponding recess in the battery cover, which extends down to a partline approximately at the level of the tops of the plates. The connector is thickened throughout the portion bridging the divider wall by being tapered laterally outwardly, and is sealed to the divider wall and depending portions of the cover by



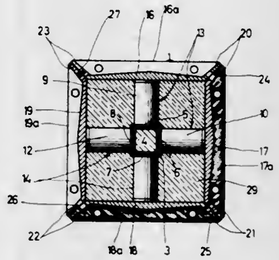
cementing material, which may be thermoplastic. Alternate forms are shown having a plurality of ridges and grooves in the upper and lower surfaces of the connector. The molding apparatus grips and inverts the battery case with the plates in place and then elevates a mold filled with molten lead into contact with the lugs of the plates to cast the connector onto the lugs and soften the cementing material. The mold is then chilled by fluid passing through an internal passageway and lowered away from the finished connector.

3,579,387
SEALED AQUEOUS ALKALINE ELECTROLYTE CELLS WITH CREEP BARRIERS
Peter R. Voyentzie and Robert J. Lehnen, Gainesville, Fla., assignors to General Electric Company
Filed Aug. 12, 1968, Ser. No. 751,968
Int. Cl. H01m *1/02*
U.S. Cl. 136—163 **2 Claims**



A sealed cell having an aqueous alkaline electrolyte may be protected from leakage by interposing a creep barrier within the creep path of the electrolyte. Alpha,alpha-dihydroperfluoroacrylate polymers have been found to be superior creep barriers when used as an adherent layer intersecting the creep path. The creep barrier may be interposed between an O-ring seal and its seat in a vented cell construction.

3,579,388
MODULAR THERMOGENERATOR
Paul Zahn, Ottobrunn, and Veit Merges, Munich, Germany, assignors to Bolkow Gesellschaft mit beschrankter Haftung, Ottobrunn, Germany
Filed Apr. 11, 1968, Ser. No. 720,662
Claims priority, application Germany, Apr. 29, 1967, B 92,311
Int. Cl. G21h *1/10*
U.S. Cl. 136—202 **10 Claims**



A thermogenerator includes a selected number of identical modules mechanically and electrically assembled to form the thermogenerator. Each module includes at least two thermocouple elements having hot ends in thermal contact with a common heat source, such as a radioactive heat source, and cold outer ends in contact with cooling surfaces or radiators. The modules have outer walls permitting assembly of plural modules to form the modular thermogenerator.

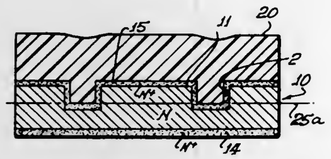
3,579,389
HIGH FREE-ACID IRON PHOSPHATE CONVERSION COATING COMPOSITION AND METHOD
George D. Howell, Alton, Ill., and Robert F. Ayres, Florissant, Mo., assignors to Electrolux Corporation, New York, N.Y.
No Drawing. Filed Oct. 31, 1967, Ser. No. 679,555
Int. Cl. C23f *7/08*
U.S. Cl. 148—6.15 **13 Claims**

A conversion coating composition for ferrous and nonferrous metal surfaces employing a phosphate composition is improved by the incorporation of ethylene diamine tetra acetates. An aqueous bath, having a relatively high free acid content, is made possible by the employment of ethylene diamine tetra acetic acid and/or its salts. The free acid to total acid ratio becomes functional even at a ratio as high as one to two, to promote the activity and accelerate the formation of uniform iron phosphate conversion coatings having a high degree of hardness, adherence and tenacity to the metal base.

3,579,390
METHOD OF MAKING A CERMET
T. O. Paine, Acting Administrator of the National Aeronautics and Space Administration, with respect to an invention of Alexis I. Kaznoff, Castro Valley, and Mickey O. Marlow, Livermore, Calif.
No Drawing. Filed Dec. 20, 1968, Ser. No. 785,780
Int. Cl. C21d *1/00*
U.S. Cl. 148—126 **6 Claims**

A cermet in which ceramic particles dispersed in a metal matrix are uncoupled therefrom. The cermet is made by pressing metal coated ceramic particles in a die at a temperature sufficient to cause bonding of the metal coatings to one another. The cermet is then heat treated to mechanically uncouple the ceramic particles from the metal matrix whereby expansion of the cermet when heated is substantially the same as that of the metal matrix.

3,579,391
METHOD OF PRODUCING DIELECTRIC ISOLATION FOR MONOLITHIC CIRCUIT
James Lang Buie, Panorama City, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Continuation-in-part of application Ser. No. 355,605, Mar. 30, 1964, now Patent No. 3,320,485. This application Jan. 5, 1967, Ser. No. 613,712
Int. Cl. H01l *7/36*
U.S. Cl. 148—175 **11 Claims**



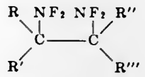
A microelectronic geometry and manufacturing process in which an electrode or region remote from the top surface of the substrate has a continuous portion deposited on the top surface to provide easier and better deposition or other emplacement of electrical contacts thereto. The method of producing dielectric isolation for one or more regions in the substrate includes the steps of cutting a groove in a semiconductor wafer surrounding the region to be isolated, establishing a highly conductive layer of semiconductor material on the top surface of the wafer and on all surfaces of the groove, establishing an insulating layer adjacent to the highly conductive layer, providing mechanical supporting substrate material to fill the groove and continue above the original top surface, and cutting off the original bottom portion along a line intersecting the bottoms of the groove and including the layer of conductive material on the bottom thereof so as to expose the insulating layer whereby when the wafer is inverted the exposed semiconductor material in the area surrounded by the groove will be dielectrically isolated by the insulating layer.

3,579,392
NITROGLYCERIN-NITROGLYCOL BLASTING COMPOSITION
Bertil Petrus Enoksson, Gyttorp, Sweden, assignor to Nitro Nobel Aktiebolag, Gyttorp, Sweden
Filed Nov. 27, 1968, Ser. No. 779,496
Claims priority, application Sweden, Nov. 27, 1967, 16,275/67
Int. Cl. C06b *1/04*
U.S. Cl. 149—7 **9 Claims**

This invention relates to blasting compositions comprising a blasting oil, an inorganic nitrate and certain desensitizing agents. These compositions are less dangerous to manufacture, less dangerous to handle, and less impact sensitive yet have the same heat of explosion and the same blasting strength as ordinary straight dynamites.

3,579,393
MONOPROPELLANT COMPRISING CERTAIN DIFLUOROAMINO COMPOUNDS AND NITRIC ACID
Barry D. Allan, Huntsville, Ala., assignor to the United States of America as represented by the Secretary of the Army
No Drawing. Filed Jan. 28, 1963, Ser. No. 254,510
Int. Cl. C06b *7/00*
U.S. Cl. 149—74 **9 Claims**

1. A liquid monopropellant composition comprising a mixture of a difluoroamino substituted compound of the formula:

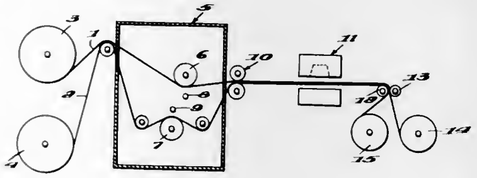


wherein R, R′, R″, and R‴ are each selected from the group consisting of alkyl, alkoxy, alkenoxy, carbalkoxy, carboxy, carbalkenoxy, alkanoyloxy, hydroxyalkyl, haloalkyl, alkoxyalkyl, and alkenyl, the total number of carbon atoms in R, R′, R″, and R‴ collectively not to exceed six and the total number of carbon atoms in each of R, R′, R″, and R‴ not to exceed four; and a white fuming nitric acid oxidant, the ratio of said acid oxidant to said difluoroamino substituted compound being from a trace amounting to 1.5 times the stoichiometric amount.

3,579,394
SOFT GROUND ETCHING METHOD
Robert F. Nelson, 410 Monrovia Ave., Long Beach, Calif. 90814
Filed Jan. 31, 1968, Ser. No. 705,882
Int. Cl. C23f *1/02*
U.S. Cl. 156—10 **6 Claims**

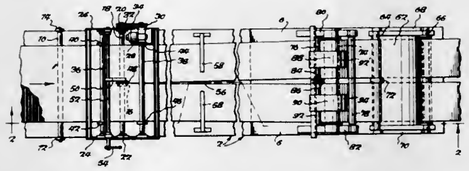
In preparing a metal plate to produce a desired picture or other designs, a resistant material covers the plate against the action of acid, and these resistant materials, called soft ground, are picked off to bare the metal plate so that the plate will be etched by the acid. The soft ground is a sticky substance which will adhere to the pattern on a cover sheet extending over the metal plate, which is called the resist. The pattern on the cover sheet may be formed in many shapes, and the protruding pattern of the sheet will pick off spots or areas of the soft ground when the sheet is pressed into engagement with the soft ground by means of a manually operated stylus. Subsequent treatment of the metal plate with a suitable acid will etch the areas picked off by the sheet and thus form the outlines of the picture or other subject.

3,579,395
METHOD AND APPARATUS FOR FORMING A MULTI-PLY THERMOPLASTIC MOLDED ARTICLE
Paul S. Rath, West Hartford, Conn., assignor to Monsanto Company, St. Louis, Mo.
Continuation-in-part of application Ser. No. 158,643, Dec. 6, 1961. This application Jan. 17, 1967, Ser. No. 632,118
Int. Cl. B32b *31/20*
U.S. Cl. 156—94 **8 Claims**



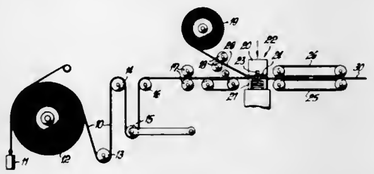
A method and apparatus for forming a rigid, laminated thermoplastic article, by treating the surfaces of plastic sheets to render them hydrophilic, pressing the treated surfaces together to form a semi-rigid, block-bonded laminate, and molding the semi-rigid laminate to form the rigid article.

3,579,396
METHOD FOR PRODUCING ROLLED EDGE BOARD
Robert L. Washburn, Whittier, and William J. Kruk, Fullerton, Calif., and William S. McDonald, Georgetown, S.C., assignors to International Paper Company, New York, N.Y.
Filed Oct. 3, 1968, Ser. No. 764,815
Int. Cl. B31f *5/00*
U.S. Cl. 156—202 **1 Claim**



A method and apparatus for making strips of closed edge corrugated board with the edges of one facing sheet folded around the open ends of the corrugated core convolutions and secured to the other facing sheet from a sheet of single faced corrugated board, cut into strips.

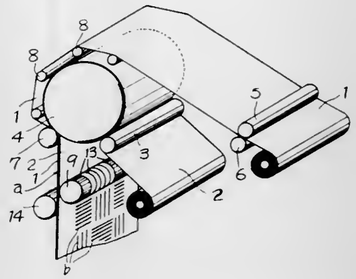
3,579,397
PROCESS OF MANUFACTURING BAGS HAVING TEAR STRIPS AND CONSISTING OF SYNTHETIC THERMOPLASTICS
August Schwarzkopf, Lengerich, Westphalia, Germany, assignor to Windmoller & Holscher, Westphalia, Germany
Filed Aug. 7, 1967, Ser. No. 658,928
Claims priority, application Germany, Aug. 16, 1966, W 42,222; June 20, 1967, W 44,214
Int. Cl. B32b *31/10*
U.S. Cl. 156—251 **6 Claims**



A tubing length portion corresponding to the length of the desired bag, and flat sheeting in a length portion corresponding to the desired width of the tear strip, are fed during each cycle of the machine between the jaws of a transverse heat sealing and cutting station, the width of the flat sheeting exceeds the width of the tubing by the length of the tear tab. A transverse heat-sealed seam joining the tubing walls and the flat sheeting is formed during the working stroke of the heat sealing and cutting device. A transverse severing cut is effected at the same time at a small distance from the heat-sealed seam and behind the same in the direction of travel.

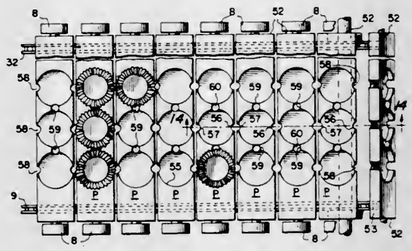
3,579,398
METHOD OF CURLING THERMOPLASTIC RESIN FILM INTO PIPES AND CONSTRUCTING UPHOLSTERY THEREWITH
Yasuhiro Oshima, 860 Kashida, Hagasiosaka, Osaka Prefecture, Japan
Filed July 23, 1968, Ser. No. 746,878
Int. Cl. B32b *31/00*
U.S. Cl. 156—250 **4 Claims**

Method of forming a decorative plastic material in which a thin plastic material is thermally expanded and sealed to another thin plastic material on a heated surface of a rotary cylinder to form a single laminated plastic film, which is simultaneously notched with a desired number of decorative patterns so that the notched portions



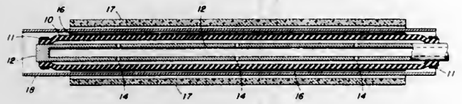
are curled to the side of the plastic material thereby supplying ornamental parts faster, easier and more economically, than prior art methods.

3,579,399
METHOD AND APPARATUS FOR ASSEMBLING A PLURALITY OF PAPER CUPS IN TRAY FORMATION AND GLUING THEM TOGETHER
Albert L. Ehe, Jamaica Estates, N.Y., assignor to Multicup Automation Company, Inc., Long Island City, N.Y.
Filed Nov. 22, 1968, Ser. No. 778,233
Int. Cl. B31b *31/12;* **B32b** *1/62*
U.S. Cl. 156—293 **6 Claims**



A method of assembling a plurality of paper cups in tray formation and gluing them together in said assembled relation together with apparatus for carrying out the method. The method consists essentially of the steps of: arranging a plurality of paper cups in a series of tray units, each of a predetermined cup number and formation, moving said tray units through a gluing station at which the cups are held in position relative to one another; applying glue to engaging cup portions; and discharging finished trays. The apparatus comprises, as characteristic elements an endless conveyor; cup receiving plates carried by the conveyor; a gluing station including a supply of heated glue below the upper ply of the conveyor, devices for holding cups in position in the plates while glue is applied, and glue applying means in the form of a gang of upright pile coated wires; means for indexing the conveyor with a stepped motion; mechanism for operating the cups holding devices and glue applying means in proper relation to movement of the conveyor, and a block out device for rendering the gluing means ineffective on certain predetermined steps to provide trays in a separated state.

3,579,400
METHOD OF POSITIONING A MEMBRANE
Anthony J. Kanyok, East Hanover, and William H. Keller, New Brunswick, N.J., assignors to American Standard Inc., New York, N.Y.
Continuation of application Ser. No. 640,304, May 22, 1967. This application Dec. 8, 1969, Ser. No. 880,465
Int. Cl. B29c *19/00*
U.S. Cl. 156—294 **4 Claims**



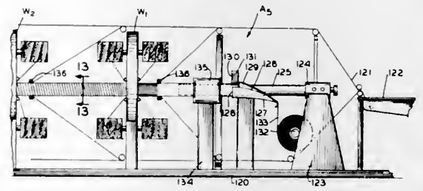
A resilient filtration membrane is inserted in a porous support tube by wrapping the membrane around a resilient tubular member, and holding the membrane in place around the tubular member while inserting the membrane and resilient tubular member into the porous support tube. The resilient member is expanded under fluid pressure and then returned to its normal state leaving the membrane against the interior wall of the porous support.

3,579,401
PROCESS FOR PRODUCING THERMAL INSULATING CARBONIZED FELT LAMINATED ASSEMBLIES
Roland Cauville and Andre Pernollet, Paris, and Gilberte Moutaud, Neuilly-sur-Seine, France, assignors to Societe le Carbone Lorraine, Paris, France
No Drawing. Filed June 30, 1967, Ser. No. 650,191
Claims priority, application France, July 26, 1966, 70,918
Int. Cl. C09j *5/00;* **C10b** *49/00;* **F16l** *59/00*
U.S. Cl. 156—327 **4 Claims**

A low density carbon felt assembly for thermal insulation is made by arranging a number of layers of viscose rayon felt coated with a relatively small amount of furane resin, applying a very light pressure, e.g. about 5 g./cm.^{2}, polymerising at atmospheric conditions, and carbonising at a temperature of 900° to 1200° C. The layers may be stacked one upon another, or wound in approximately cylindrical layers one around the other. The carbonised product may be graphitised at 2400° to 3000° C. Thus, a thermal insulating carbonized or graphitized viscose rayon having a density of less than 0.485 gm./cm.^{3} is produced.

3,579,402
METHOD AND APPARATUS FOR PRODUCING FILAMENT REINFORCED TUBULAR PRODUCTS ON A CONTINUOUS BASIS
William B. Goldsworthy, Palos Verdes, and Ethridge E. Hardesty, Pine Valley, Calif., assignors to Goldsworthy Engineering, Inc.
Continuation-in-part of application Ser. No. 633,146, Apr. 24, 1967. This application Apr. 23, 1968, Ser. No. 723,554
Int. Cl. B65h *81/02*
U.S. Cl. 156—392 **19 Claims**

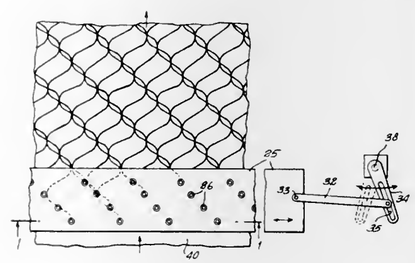
A device for making filament reinforced tubular products in a continuous manner. The device includes a series of filament spools. Filaments from the spools are passed through a resin tank and around a fixed mandrel to form the longitudinal strands of the tube. The mandrel has substantially the same internal size and shape of the continuous tube to be produced. The mandrel extends through a plurality of helical filament wrap devices which are designed to apply opposing helically wound strands of filament upon the interspersed layers of longitudinal strands. The mandrel extends also through a pair of circumferential filament wrap devices for laying outermost surface circumferential strands in opposite directions with respect to each other and superimposed upon the helical immediately proceeding final strands. The several layers of such strands which have been wound on the fixed mandrel are urged into the R. F. curing zone on the mandrel which also extends into the curing zone. After the resin matrix has been cured, the finally formed and



cured tube is pulled from the mandrel by a pulling unit.

A number of embodiments are disclosed for making continuously wound pipe. In another embodiment, the device is mounted on a moving vehicle such as a boat where pipe which is continuously made is deposited from the moving vehicle. In an additional embodiment of the invention, a rectangular mandrel is employed for wrapping tube-like sections having a somewhat rectangular cross section, capable of being used in the construction of ladder rails and similar structural elements.

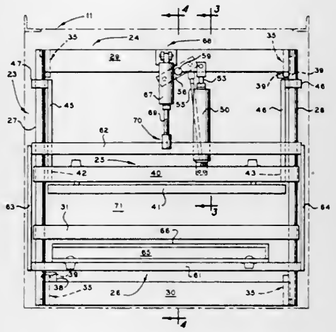
3,579,403
APPARATUS FOR MAKING COMPOSITE FILAMENT OR FIBER THERMOPLASTIC PRODUCTS
John Henry Stroop, New York, N.Y., assignor to Total Packaging, Inc., New York, N.Y.
Filed Dec. 16, 1966, Ser. No. 602,348
Int. Cl. B65h *51/16*
U.S. Cl. 156—433 **4 Claims**



Paper is ordinarily produced by a Fourdrinier process and apparatus, and textile fabrics are produced by spinning and weaving. This invention has many of the advantages of each and utilizes a plurality of multi-product spinner nozzles. A plate on which the spinner nozzles are mounted is reciprocated so that filaments discharged from the plurality of spinner nozzles are overlaid and produce a thermoplastic fabric. The filaments are composed of more than one material and are called composite filaments.

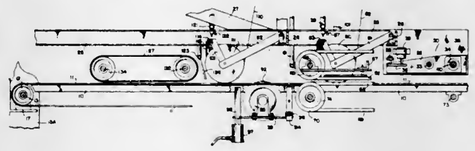
A modification provides a box containing a plurality of cut fibers which are advanced by a carding loom picker. One of the substances described in the first alternative as discharged from the spinner nozzles is in this alternative sprayed onto a moving sheet which then proceeds through calendering and desired embossing, perforating and printing rolls.

3,579,404
CUTTING AND SEALING UNIT
Robert J. Spitznagel, Cincinnati, Ohio, assignor to Phillips Petroleum Company
Filed Mar. 6, 1969, Ser. No. 804,846
Int. Cl. B32b *31/20;* **B65b** *51/14, 51/30*
U.S. Cl. 156—515 **5 Claims**



A cutting and sealing unit for plastic packaging machines. The unit comprises three relatively movable frames, two of which include gripping jaws and the third, a heat sealing and cutting knife.

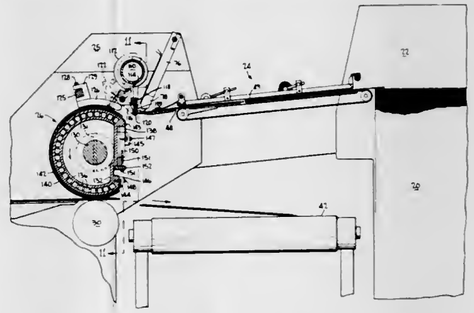
3,579,405
MACHINE FOR INTERCONNECTING VENEER PANELS
John H. Crawford, Corvallis, Oreg., assignor to Leading Plywood, Corvallis, Oreg.
Filed Apr. 9, 1968, Ser. No. 719,972
Int. Cl. B32b *31/12, 31/10*
U.S. Cl. 156—546 **8 Claims**



A machine for the application of continuous elements to a series of abutting veneer panels to interconnect contiguous panels for use in an article of manufacture. Means are disclosed for both conveying and positioning each of the panels into side-by-side relationship with an adjacent panel subsequent to which the continuous element is applied. Such means includes continuous belts disposed above and below the panels. The continuous elements disclosed is glue bearing and applied by wheels in rolling contact with the panels. For drying the glue bearing elements on said panels a directed air flow is provided.

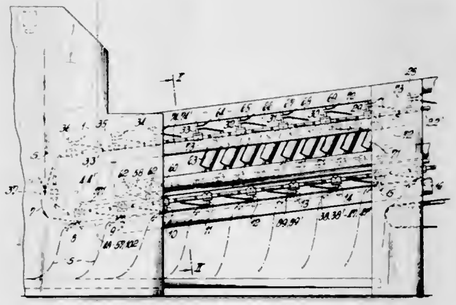
3,579,406
HIGH SPEED PRECISION COMBINER
William H. Eburn, Jr., Stamford, and Charles T. Raymond. Westport, Conn., assignors to Selchow & Righter Company, Bay Shore, N.Y.
Filed July 25, 1968, Ser. No. 747,689
Int. Cl. B65c *9/08;* **B65h** *1/22*
U.S. Cl. 156—571 **13 Claims**

Apparatus for combining two sets of sheet material in a registered relationship to one another includes separate means for feeding each set of sheet material in synchronization with one another, a number of gripping mechanisms for grasping the individual sheets of a first material to transport it onto a rotating drum mechanism wherein the gripping mechanisms accelerate from a position at rest to a speed substantially equal to the speed of rotation of the drum to deposit the first sheet material in a registered position thereon, a blanket mounted in registered position on the surface of the drum and having perforations for developing a vacuum to retain the individual sheet material, means for applying adhesive to the individual sheets of the material on said drum, means for combining the two sheets of material in aligned relationship to each other, and means connected with said drum to provide a positive blow-off pressure to said first sheet material at said means for combining. The



means for delivering the second sheet material includes a hopper for receiving and storing the material in vertically stacked relationship and means for sensing the height of the material to control the delivery of a second sheet material to the hopper. The delivery and hopper mechanisms are mounted on movable rails whereby those mechanisms can be elevated to disengage the second sheet material from a feeding mechanism in the absence of second sheet material. The delivery means for the second sheet material has a speed control which is regulated to prevent damage of the second sheet material when it is engaged by the driving means and when the second material is delivered to the means for combining.

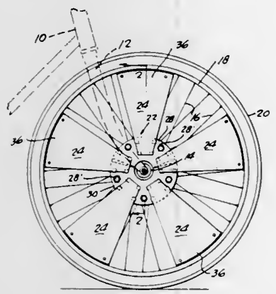
3,579,407
MACHINE FOR HEAT SEALING CONTINUOUSLY MOVING WORK-MATERIAL SHEETING IN THE MANUFACTURE OF BAGS OF PLASTICS MATERIALS
Kurt Rochla, Lengerich, Westphalia, Germany, assignor to Windmoller & Holscher, Westphalia, Germany
Filed Aug. 15, 1968, Ser. No. 752,930
Claims priority, application Germany, Aug. 18, 1967, W 44,584
Int. Cl. B30b *15/34;* **B32b** *31/20*
U.S. Cl. 156—583 **19 Claims**



A plurality of heat sealing jaw sets are secured to endless conveyor chains and revolve at the velocity of the

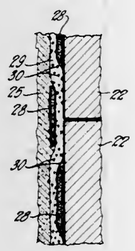
workpieces. A plurality of said heat sealing jaw sets are in action simultaneously. The heat sealing set is adapted to be energized in dependence on the machine cycle and to be de-energized by means of a timing element after a predetermined interval of time.

3,579,408
ORNAMENTAL DEVICE FOR ATTACHMENT TO WIRE SPOKED WHEELS
Wesley P. Dowhan, 46 N. Water St., P.O. Box 272, Warehouse Point, Conn. 06088
Filed June 21, 1968, Ser. No. 739,102
Int. Cl. D04d *7/04;* **B60b** *7/04*
U.S. Cl. 161—7 **6 Claims**



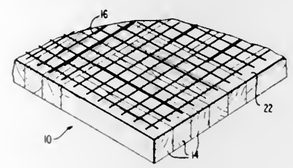
Ornamental device for attachment to a wheel having wire spokes, said device comprising: a central, segmented annular disc; a plurality of fan-shaped blades; means for connecting the small ends of said blades to said disc, and means securing the wide ends of said blades to the spokes of a wheel.

3,579,409
HIGH STRENGTH PLASTIC COATED FIBER YARN FABRIC FOR STRUCTURAL REINFORCEMENT
Richard F. Shannon, Lancaster, Ohio, assignor to Owens-Corning Fiberglas Corporation
Filed May 17, 1967, Ser. No. 639,069
Int. Cl. B32b *5/16*
U.S. Cl. 161—39 **18 Claims**



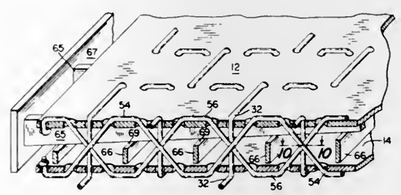
A flexible, extremely thin fabric particularly well-suited for the reinforcement of thin layers of plaster, mortar, cement, or like structural materials. The fabric is comprised of fabric yarns having barbed anti-slip surfaces firmly interfused in crosswise open-mesh relationship. Additionally, the fabric yarns respectively define a generally rectangular cross-sectional configuration in which the width across which the yarn is interfused is from approximately six to eighteen times greater than the yarn thickness. The method of producing the fabric involves heating an open-mesh fabric constructed from glass fiber yarns coated with a thermoplastic organic coating to a temperature sufficient to transform the thermoplastic coating to a heat-softened fusible condition. While the thermoplastic coating remains in a fusible condition, the fabric is compressed to flatten and interfuse the fabric yarns. Also, while the thermoplastic coating is in a heat-softened condition, finely-divided solid fragments of an inorganic material are randomly deposited or scattered on the surfaces of the fabric and embedded in the plastic coating to form a barbed anti-slip surface on the fabric.

3,579,410
PARQUET FLOORING BLOCK AND METHOD OF MAKING SAME
Lawrence G. Barrett, Lynchburg, Va., assignor to The American Novawood Corporation, Lynchburg, Va.
Filed Sept. 6, 1967, Ser. No. 665,860
Int. Cl. E04f *13/10, 13/18, 15/16*
U.S. Cl. 161—38 **6 Claims**



A prefinished unit of parquet booring impregnated throughout the total thickness thereof with a monomer that is polymerized to a plastic material having a high resistance to abrasive wear. The separate slats, which may be quite thin, are assembled in blocks prior to conversion from ordinary wood to a wood-plastic composite, and the block may thereafter be prefinished before shipping and easily laid on a sub-floor without the need for on-site floor finishing crews.

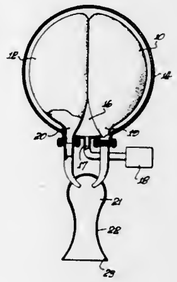
3,579,411
FILAMENT REINFORCED STRUCTURE AND METHOD OF MAKING
William L. Mackie, 394 Court Ave., and Edgar D. Wilson, 5239 Aurora Drive, both of Ventura, Calif. 93003
Filed Sept. 27, 1967, Ser. No. 671,157
Int. Cl. B32b *7/08*
U.S. Cl. 161—53 **1 Claim**



A lightweight, high strength structure and method of making same. Spaced panels are interconnected by high tensile strength flexible filaments of glass fiber or metal which filaments penetrate through the panels, and are woven back and forth. The portions of the filaments extending between the panels are subsequently rigidized by the addition of a coating which, when solidified, imparts substantial compressive strength. To counter shear

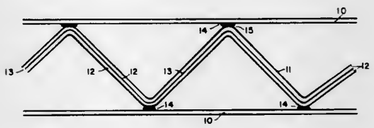
forces certain filaments may be arranged to slant in the direction of anticipated stress. Since the filaments pass through and overlie portions of the panels they effectively counter delamination or peeling.

3,579,412
FLUID IMPERVIOUS BARRIER INCLUDING LIQUID METAL ALLOY AND METHOD OF MAKING SAME
T. O. Paine, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Albert J. Bauman, Sierra Madre, Calif.
Filed May 29, 1968, Ser. No. 732,922
Int. Cl. D06q *1/04*
U.S. Cl. 161—89 **15 Claims**



A flexible barrier membrane comprising a porous substrate and incorporated liquid metal provides structures highly impervious to gases and liquids, and self-sealing to small punctures. Fabrics of metal or synthetic textile are impregnated with low melting alloys, such as alloys of gallium or indium metal, and used as sealant barriers for spacecraft walls and as flexible membrane barriers for pumping liquid propellants.

3,579,413
CORRUGATED BOARD CONSTRUCTION
Russell E. Koons, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Jan. 3, 1966, Ser. No. 519,813
Int. Cl. B32b *11/06*
U.S. Cl. 161—135 **3 Claims**

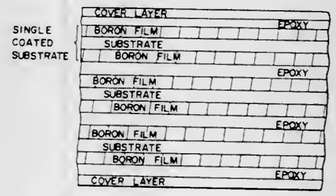


Corrugated board materials having improved properties are made utilizing a corrugated sheet comprising a laminate of at least two corrugated sheets laminated together with an asphalt-wax composition. The composition is comprised of 80 to 97 weight percent asphalt and 3 to 20 weight percent petroleum derived wax. The composition has a softening point of from 170 to 230° F., a penetration at 32° F., 200 grams, 60 seconds of 15 to 30 mm./10, a penetration at 77° F., 100 grams, 5 seconds of 25 to 45 mm./10, a penetration at 115° F., 50 grams, 5 seconds of 40 to 70 mm./10 and a viscosity (Saybolt Furol) at 375° F. of 25 to 250 seconds.

3,579,414
POLYAMIDE CONJUGATE FILAMENT
Keizo Ueda, Nishinomiya, Tsuneo Ohkawahara, Hirakata, and Masao Matsui and Satoshi Ando, Osaka, Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan
No Drawing. Application Sept. 26, 1968, Ser. No. 768,956, now Patent No. 3,515,703, dated June 2, 1970, which is a continuation of application Ser. No. 368,691, May 19, 1964. Divided and this application Aug. 14, 1969, Ser. No. 871,232
Int. Cl. D02g *3/04*
U.S. Cl. 161—173 **2 Claims**

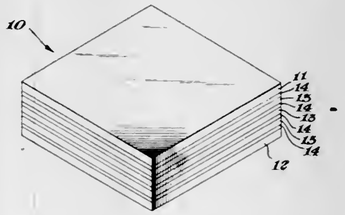
A drawn nylon filament having superior heat durability, Young's modulus and dyeability which consists essentially of a copolyamide of undecamethylene terephthalamide and epsilon-caproamide, the latter being present in the range of from about 3 to 40% by weight of the copolyamide.

3,579,415
STRUCTURAL LAMINATES
Lloyd R. Allen, Belmont, Norman Beecher, Concord, Frank Feakes, Lexington, and James F. Springfield, Reading, Mass., assignors to National Research Corporation, Newton Highlands, Mass.
Filed June 29, 1967, Ser. No. 650,103
Int. Cl. B32b *15/04;* **C23c** *13/0, 13/04*
U.S. Cl. 161—184 **1 Claim**



Lightweight structures of high specific modulus and specific strength (modulus of elasticity and ultimate strength, respectively, divided by density) can be achieved by structural laminates comprising rigid materials characterized by brittleness and high stiffness formed as films and laid up in laminates. The adjacent films of the laminates are secured to each other by adhesives or hot pressed self bonding. The liminates offer a significant advantage over the prior art filament and fiber reinforced composite systems in that the laminates offer their strength and rigidly in all directions in the plane of the laminate.

3,579,416
PACKAGING FILM COMPRISING POLYOLEFIN OUTER LAYERS AND PLURAL INNER GAS BARRIER LAYERS
Walter J. Schrenk, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Filed Dec. 19, 1966, Ser. No. 602,899
Int. Cl. B32b *27/08, 27/30, 27/32*
U.S. Cl. 161—254 **6 Claims**



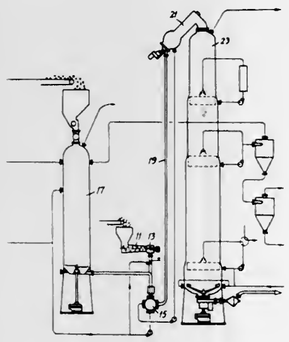
A packaging film is claimed which incorporates a gas barrier core such as vinylidene chloride polymer, the gas

barrier core is slit into a plurality of layers which provides improved barrier properties and crumple resistance over a single layer core.

3,579,417
CONTINUOUS DIGESTER WOOD CHIP LEVEL CONTROL
Lawrence Allan Carlsmith, Amherst, N.H., assignor to Improved Machinery Inc., Nashua, N.H.
Continuation of application Ser. No. 543,363, Apr. 18, 1966. This application May 12, 1969, Ser. No. 828,421
Int. Cl. D21c *3/26*
U.S. Cl. 162—17 **3 Claims**

Apparatus and method for continuous pulping in an upright elongated reaction vessel by feeding substantially continuously wood chips and a liquid into the reaction vessel at its lower end to maintain therein a columnar mass of compacted wood chips with its lower end normally spaced upwardly from the lower end of the vessel and advancing the wood chips upwardly throughout the length of said column by advancing liquid upwardly through a liquid propelling zone in the lower portion of the column. The vessel has three vertically spaced pressure sensing means with the lower two of the pressure sensing means spaced respectively above and below the normal position of the lower end of the chip mass and the uppermost one of the pressure sensing means spaced above said lower two to sense said position for control thereof. Comparator means are connected to each of the lower and upper two of the pressure sensing means for comparing the sensed signals therefrom providing output signals resposive to said position and means are provided for comparing the output signal from the lower two of the pressure sensing means with the output signal from the upper two of the pressure sensing means to produce a corrected output signal responsive to the position of the lower end of said chip mass by means of which the propelling liquid flow rate is controlled to control said position.

3,579,418
METHOD AND APPARATUS FOR COMMON DIGESTION OF WOOD CHIPS AND SAW DUST
Bengt Sven Erik Ostberg, Karlstad, Sweden, assignor to Aktiebolaget Kamyr, Karlstad, Sweden
Filed Sept. 18, 1968, Ser. No. 760,487
Claims priority, application Sweden, Sept. 21, 1967, 12,989/67
Int. Cl. D21c *7/06*
U.S. Cl. 162—18 **6 Claims**

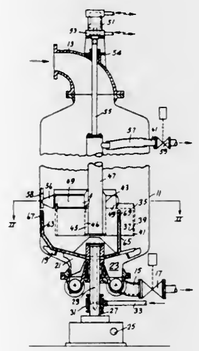


A method and apparatus wherein saw dust is mixed with regular wood chips and digested. In order to prevent clogging of the screens in the chips feeding devices and the digester, coherent bodies, for example pellets or plugs, are formed out of the saw dust by compression. The cohesion of the bodies may be further improved by adding an adhesive or cementing agent. The saw dust bodies are added to the chips in the chute of the high-pressure feeder valve and are fed to the digester top by circulating liquid.

3,579,419
TREATMENT OF FLUFFED PULP FIBERS WITH GASEOUS CHLORINE
Frederic H. Yorston, Montreal, Quebec, and Norman Liebergott, Chomedey, Laval, Quebec, Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Quebec, Canada
Filed Apr. 24, 1967, Ser. No. 633,292
Int. Cl. D21c *9/12*
U.S. Cl. 162—66 **6 Claims**

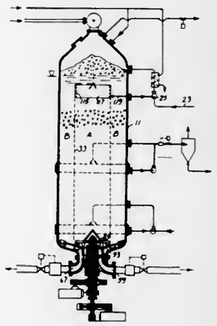
The invention is directed to treating a solid, such as wood pulp in the form of fluff, with a gaseous reactant such as chlorine. The fluff is first passed through a zone containing the gas. The residence time is limited to such that less than the potential amount of the gas is acquired by the fluff. Then the fluff including the acquired gas is allowed to remain in a zone free of the treating gas for a length of time sufficient to permit the acquired gas to react with the fluff.

3,579,420
SIEVE DEVICE IN AN UPRIGHT CYLINDRICAL CONTAINER FOR CONTINUOUS FLOW OF CELLULOSIC MATERIAL
Johan C. F. C. Richter, St. Jean Cap Ferrat, France, assignor to Aktiebolaget Kamyr, Karlstad, Sweden
Filed Apr. 30, 1968, Ser. No. 725,287
Claims priority, application Sweden, May 5, 1967, 6,340/67
Int. Cl. D21c *7/00*
U.S. Cl. 162—237 **1 Claim**



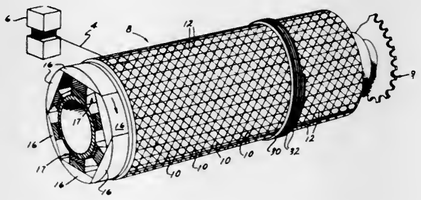
At least one hollow sieve body having coaxial cylindrical sieve faces is located near the lower end of a cylindrical container through which a mixture of cellulosic material and a treating liquid is passed vertically downwards. The sieve body is suspended by a vertical tube located centrally of the container which tube further serves for discharging filtrate from the interior of the sieve body. An operating means at the top of the container periodically lifts the sieve body, which, intermediate of the periodic lifts, moves downwardly with the cellulosic material. The sieve body is given stability by radial support arms which slidably communicate with guide means fixed to the inner side of the container.

3,579,421
CONTINUOUS CELLULOSE DIGESTER WITH TWO SEPARATE PULP OUTLETS
Johan C. F. C. Richter, St. Jean Cap Ferrat, France, assignor to Aktiebolaget Kamyr, Karlstad, Sweden
Filed May 13, 1968, Ser. No. 728,396
Claims priority, application Sweden, May 16, 1967, 6,788/67
Int. Cl. D21c *7/08*
U.S. Cl. 162—237 **8 Claims**



A continuous cellulose digester is provided with two pulp discharging means, one discharging the core of the moving plug of cellulosic material through a first outlet and the other discharging the peripheral parts of the plug through a second outlet. The first discharging means may be a rotary scraper working in the center area only of the outlet end of the digester, the second discharging means working in the surrounding annular space. The first outlet and discharging means is separated from the second outlet and discharging means by a partition means which is concentric to the digester wall.

3,579,422
FILAMENT WOUND CYLINDRICAL STRUCTURES FOR USE IN PAPER MAKING
David G. Minick, Westfield, and David H. Sinclair, South Hadley, Mass., assignors to The Sinclair Company, Holyoke, Mass.
Filed Oct. 7, 1968, Ser. No. 765,487
Int. Cl. D21f *1/46*
U.S. Cl. 162—314 **8 Claims**



Cylindrical structure, such as a "dandy roll," constructed by the method of continuous filament winding in a honeycomb or open-work pattern formed on a collapsible mandrel. The filaments are impregnated with a thermosetting resin at the time of their application to the mandrel and the resin is cured and hardened to provide the open-work rib structure. In one embodiment the structure is composed of upstanding ribs formed on the dandy roll and bonded together in a hexagonal-triangular honeycomb pattern.

3,579,423
PREPARATION OF TISSUE CULTURE MEDIA
Isao Yamane and Yutaka Matsuya, Sendai, and Katsuhiko Jimbo, Saitama, Japan, assignors to Flow Laboratories, Inc., Rockville, Md.
No Drawing. Filed Dec. 13, 1968, Ser. No. 784,296
Int. Cl. A61k *27/00*
U.S. Cl. 195—1.7 **11 Claims**

A powdered nutrient composition is provided containing most of the nutrition requirements for culturing animal cells and an acidic buffering agent to maintain the pH of an aqueous solution of the composition at 3.5–5.0. This composition can be dissolved in water and sterilized by autoclaving prior to its incorporation in a tissue culture medium. After autoclaving of the nutrient composition, sterile solutions of glutamine and bicarbonate ions are aseptically added to the composition to form a tissue culture medium.

3,579,424
MICROBIAL PRODUCTION OF CARBON ^{14}C LABELLED ALL-TRANS BETA-CAROTENE
Albert E. Purcell and William M. Walter, Jr., Raleigh, N.C., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed Apr. 7, 1969, Ser. No. 814,526
Int. Cl. C12d *5/00*
U.S. Cl. 195—28 **4 Claims**

Purified all-trans ^{14}C beta-carotene has been prepared in multimilligram amounts with over three million ^{14}C disintegration per minute per milligram. This process utilizes economical radioactive substrates more efficiently than processes of the prior art. Better than 1% ^{14}C tagged atom goes into beta-carotene. The labeled (^{14}C beta-carotene) obtained can be used as a tracer in studies of autooxidation in food products and metabolisms of beta-carotene and vitamin A in animals.

3,579,425
PREPARATION OF PROSTAGLANDINS
David Adriaan van Dorp and Roelof Karel Beerthuis, Vlaardingen, Diederik Hendrik Nugteren, Rhoon, and Hendrik Vonkeman, Maassluis, Netherlands, assignors to Unilever N.V., Rotterdam, Netherlands
No Drawing. Continuation-in-part of application Ser. No. 700,030, Jan. 24, 1968, which is a continuation-in-part of application Ser. No. 453,483, May 5, 1965. This application Aug. 29, 1969, Ser. No. 854,250
Claims priority, application Great Britain, May 8, 1964, 19,237/64; July 15, 1964, 29,052/64
Int. Cl. C12d *1/02*
U.S. Cl. 195—30 **21 Claims**

The specification discloses a process for preparing prostaglandins which comprises incubating, under aerobic conditions, a mixture comprising a prostaglandin-synthesizing enzyme system prepared from animal tissue, glutathione, and an all-cis polyunsaturated carboxylic acid of the formula

$$CH_3(CH_2)_n(CH{=}CHCH_2)_p(CH_2)_qCOOH$$

wherein n is a number from 0 to 5, p is a number from 3 to 5, and q is a number from 0 to 8, with the proviso that the sum of $n+3p+q$ is from 16 to 20 and that when p is 3 then n is a number from 3 to 5. The enzyme system is obtained from living animal organ cells, e.g., thymus, iris, genital glands and the like.

3,579,426

MICROBIOLOGICAL DEMETHYLATION OF 7-HALO-7-DEOXYLINCOMYCINS

Alexander D. Argoudelis, John H. Coats, Donald J. Mason, and Oldrich K. Sebek, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

No Drawing. Filed Oct. 21, 1968, Ser. No. 769,411

Int. Cl. C12d *9/00*

U.S. Cl. 195—80 **7 Claims**

A microbiological process for the 1'-demethylation of 7-halo-7-deoxylincomycins to obtain the corresponding 7-halo-7-deoxy-1-demethyllincomycins, which are known active antibacterial agents with broader scope of activity than the present compounds.

3,579,427

PROCESS FOR PRODUCING METHIONINE DECARBOXYLASE

Kiyoshi Nakayama, Sagamihara-shi, and Hiroshi Hagino, Hachioji-shi, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

No Drawing. Filed Feb. 13, 1968, Ser. No. 704,992

Claims priority, application Japan, Feb. 20, 1967, 42/10,419

Int. Cl. C12d *13/10*

U.S. Cl. 195—66 **9 Claims**

A process for producing the enzyme methionine decarboxylase which comprises culturing a microorganism capable of producing methionine decarboxylase under aerobic conditions in an aqueous nutrient medium containing L-methionine, accumulating the methionine decarboxylase in the resultant culture liquor, and recovering the same therefrom. Suitable microorganisms which may be employed are those belonging to the genus Streptomyces.

3,579,428

METHOD OF MANUFACTURING PLATED POLYPROPYLENE SHAPED ARTICLES

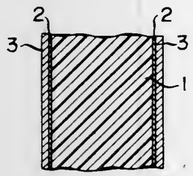
Toshihiko Kuroda, Sotoo Sutani, Haruo Nitta, Rikio Takahashi, and Sadao Saito, Yokkaichi-shi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Tokyo, Japan

Filed Sept. 23, 1968, Ser. No. 761,767

Claims priority, application Japan, Sept. 30, 1967, 42/62,648; June 17, 1968, 43/41,335

Int. Cl. C23b *5/60, 3/02*

U.S. Cl. 204—30 **1 Claim**



Method of manufacturing a plated polypropylene which comprises subjecting a polypropylene composition containing 20–50% by weight of an inorganic powder having an average particle size of less than 20 microns based on the total weight of said composition to a treatment with an acid solution containing an oxidizing agent and further subjecting thus treated polypropylene composition to a plating process.

3,579,429

PROCESS FOR APPLYING A WHITE PAINT ELECTROPHORETICALLY

Frank E. Manson, Lansdale, and Lester Steinbrecher, Southampton, Pa., assignors to Amchem Products, Inc., Ambler, Pa.

No Drawing. Continuation-in-part of application Ser. No. 630,839, Apr. 14, 1967. This application Jan. 6, 1970, Ser. No. 1,056

Int. Cl. B01k *5/02;* **C23b** *13/00*

U.S. Cl. 204—181 **20 Claims**

A white paint film applied to an iron or steel surface by the electrophoretic method of painting tends to be of a muddy, off-white or yellowish color; also, foreign deposits on the surface to be painted show-up in the white paint film as color imperfections. These problems are avoided by pretreating the iron or steel surface with an aqueous solution of copper to apply thereto copper deposits and thereafter painting the pretreated surface with a white paint by the electrophoretic method of painting.

3,579,430

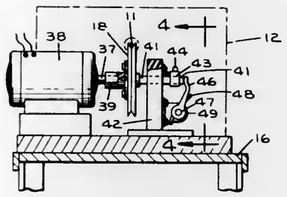
APPARATUS FOR ELECTROPLATING WIRE

Philip E. Lawler, Papillion, Nebr., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed Mar. 13, 1969, Ser. No. 806,899

Int. Cl. C23b *5/08*

U.S. Cl. 204—206 **5 Claims**



In apparatus for electroplating wire, in which the wire is advanced longitudinally through a plating tank, the wire passes over electrical contact members mounted externally of the plating tank adjacent its wire entrance and wire exit ends. The contact members are rotatably driven by separate adjustable torque motors so as to maintain the wire under tension and thereby maintain good electrical contact between the wire and the contact members. In order that the tension in the wire, and thus the plating current flowing in the system, will be maintained at substantially uniform values, the magnitude of friction variables in the system is reduced by fixedly mounting each contact member on a cantilevered portion of a drive shaft of its respective motor, and by feeding electrical current into each contact member through a single contact brush engageable therewith at its axis of rotation.

3,579,431

CELL FOR ELECTROLYTIC DEPOSITION OF METALS

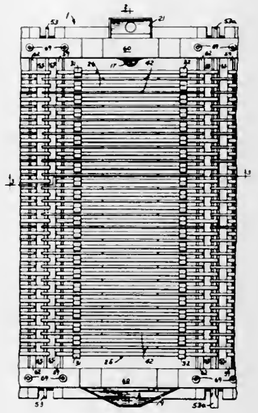
Peter M. Jasberg, Kellogg, Idaho, assignor to The Bunker Hill Company, Kellogg, Idaho

Filed Feb. 23, 1968, Ser. No. 707,847

Int. Cl. B01k *3/00, 3/02*

U.S. Cl. 204—275 **18 Claims**

A cell assembly for electrolytic deposition of metals, designed to facilitate the electrolytic deposition and recovery of zinc or other metals similarly processed. The cell assembly includes an improved cell box comprising a treated wooden structure having a one piece protective liner. The liner includes an integral inlet box and outlet weir to insure consistent solution line elevation. An improved cathode structure is utilized, having protective non-conductive coverings applied thereto along the side and top portions of the plate on which metal is deposited.



Improved anode assemblies include stiffening plastic guides attached thereto which position the cathodes relative to the anode structures in a constant spaced parallel relationship. Control of the deposition of metal is further achieved by an improved bus bar support system for the cathode and anode units, facilitating accurate adjustment and leveling of the units relative to the electrolyte.

3,579,432

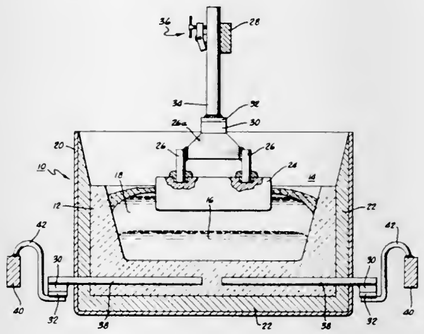
ELECTROLYTIC REDUCTION CELL

Walter D. Finnegan, Spokane, Wash., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Sept. 23, 1968, Ser. No. 761,421

Int. Cl. B01k *3/04;* **C23b** *5/70*

U.S. Cl. 204—279 **7 Claims**



A composite electrical conductor adapted to contact an electrode in current transmitting engagement. A ferrous metal plate is affixed to the free end of a ferrous metal rod adapted to be embedded in the electrode. A soft aluminous plate is roll bonded along one face to the ferrous plate affixed to the rod. An aluminum conductor rod is welded to the aluminous plate roll bonded to the ferrous plate and is adapted to be connected to a source of electric current.

3,579,433

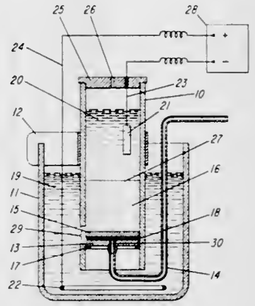
VERTICAL COLUMN ELECTROPHORESIS APPARATUS

Donald A. Dahlgren, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 24, 1968, Ser. No. 723,658

Int. Cl. B01k *5/00*

U.S. Cl. 204—299 **6 Claims**



An apparatus for gel electrophoresis of proteinaceous materials includes an electrophoretic gel column, means to establish a substantially uniform unidirectional potential longitudinally across the column, and a collection chamber below the column. A buffer solution enters the collection chamber and radially sweeps the proteinaceous material entering the chamber from the column toward a centrally situated exit means and downwardly therethrough.

3,579,434

HYDROCRACKING OF NAPHTHA

Robert B. Smith, Pitman, and Barton W. Rope, Mullica Hill, N.J., assignors to Mobil Oil Corporation

No Drawing. Filed July 2, 1968, Ser. No. 741,867

Int. Cl. C10g *13/02, 13/10*

U.S. Cl. 208—111 **2 Claims**

A composition comprising a small quantity of palladium, generally between 0.05 and 5.0 weight percent palladium, deposited on a chelated hydrogen form of zeolite Y. A method of hydrocracking naphtha to LPG which comprises contacting a naphtha charge under hydrocracking conditions with the aforenoted catalyst.

3,579,435

HYDROCRACKING PROCESS

Albert T. Olenzak, Media, and Sheldon L. Thompson, Glen Mills, Pa., assignors to Sun Oil Company, Philadelphia, Pa.

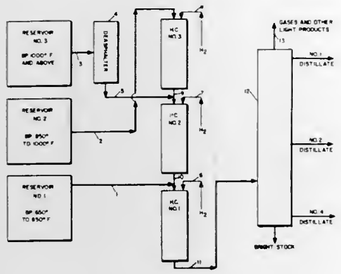
Filed June 20, 1968, Ser. No. 738,432

Int. Cl. C10g *13/00, 37/02*

U.S. Cl. 208—59 **9 Claims**

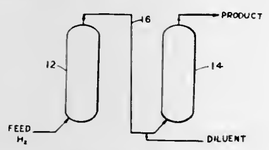
A process for hydrocracking lubricating oil stocks to lubricating oils of higher viscosity index in which the portions of a crude suitable for hydrocracking are fractionated into a plurality of fractions commensurate with the boiling point, molecular weight, or polyfused-ring aromatic content and each of said fractions is subjected to hydrocracking conditions commensurate with the polyfused-ring aromatic content over a hydrocracking catalyst at a temperature in the range of about 650° to 875° F. and a hydrogen partial pressure of at least about 1500 p.s.i. Preferably, the charge stock is fractionated into three fractions, the first fraction boiling in the range of about 650° to 850° F., the second fraction boiling in the range of about 850° to 1000° F., and the third fraction containing all the material boiling above about 1000° F. which has been deasphalted; and each of the foregoing

fractions is separately hydrocracked for at least a portion of the total time it is hydrocracked, preferably over a hydrocracking catalyst comprised of a sulfide of a Group VI metal, left-hand column, and/or an iron group metal, and



most preferably a mixture of nickel sulfide and tungsten sulfide in a 1/1 to 4/1 metal ion ratio, at a temperature in the range of about 735° to 825° F. and a hydrogen partial pressure of about 2500 to about 4000 p.s.i.

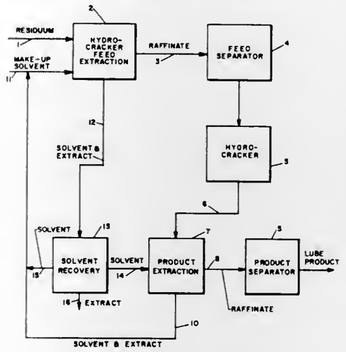
3,579,436
MULTISTAGE CONVERSION PROCESS
William R. Mounce, East Windsor Township, N.J., assignor to Cities Service Research and Development Company, New York, N.Y.
Filed June 30, 1969, Ser. No. 837,750
Int. Cl. C10g *13/00*
U.S. Cl. 208—59 **9 Claims**



A process for the efficient hydrocracking of a heavy hydrocarbon oil such as vacuum or atmospheric residuums is disclosed herein. The heavy oil is contacted with hydrogen in the presence of a particulate catalyst at high pressures, preferably between 1,500 and about 3,000 p.s.i., and high temperatures, preferably between 800° F. and 850° F., by passing the heavy oil and a hydrogen containing gas upwardly through the particulate catalyst in a first reactor. Effluent from the first reactor is mixed with a hydrocarbon diluent and passed upwardly through a catalyst bed in a second high pressure and high temperature reactor maintained at similar conditions to the first reactor. Oil is withdrawn from the second reactor for further processing as may be desired. Preferably the diluent is a hydrocarbon stream boiling in the range of from 500° to 975° F. and more preferably 600° F. to 800° F. and is mixed with the effluent from the first reactor in the amount of from 20% to 100% by volume of the volume of the effluent.

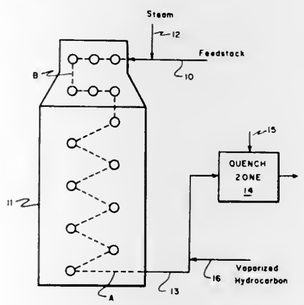
3,579,437
PREPARATION OF HIGH V.I. LUBE OILS
William W. Wentzheimer, Drexel Hill, Pa., Ronald W. Reynolds, Claymont, Del., and William Chalpin, Berwyn, Pa., assignors to Sun Oil Company, Philadelphia, Pa.
Filed Apr. 3, 1969, Ser. No. 813,255
Int. Cl. C10g *13/02*
U.S. Cl. 208—87 **6 Claims**

A process for producing high quality and highly stable lubricating oils with a high viscosity index wherein a lubricating oil fraction is first solvent extracted with a solvent having preferential solubility for aromatics to reduce the polycyclic aromatic content thereof and wherein raffinate from said extraction is hydrocracked under conditions to increase the viscosity index thereof and wherein hydrocracked lubricating oil product is subjected to a second



extraction with a solvent having preferential solubility for aromatics, and including the improvement herein comprising separating the solvent and extract from the lubricating oil raffinate product of said second extraction and employing said solvent with product extract therein for the extraction of hydrocracker charge stock in said first extraction.

3,579,438
THERMAL CRACKING
Carl M. Cruse, Dickinson, Tex., assignor to Monsanto Company, St. Louis, Mo.
Continuation-in-part of application Ser. No. 640,118, May 22, 1967. This application Apr. 20, 1970, Ser. No. 30,252
Int. Cl. C10g *9/14*
U.S. Cl. 208—130 **15 Claims**

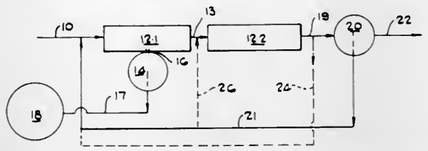


A process for thermally cracking a normally liquid hydrocarbon in a tubular reactor wherein C_4 and higher hydrocarbons are injected prior to the quench zone.

3,579,439
TREATMENT OF SEWAGE
Pieter Gerhard Jacobus Meiring and Peter Hendrik Huisman, Pretoria, Transvaal, Republic of South Africa, assignors to South African Inventions Development Corporation
Filed May 27, 1969, Ser. No. 828,116
Int. Cl. C02c *1/10*
U.S. Cl. 210—5 **9 Claims**

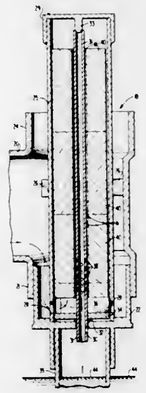
The invention provides for a process of and an apparatus for the treatment of sewage according to the activated sludge process. In this process and apparatus, raw sewage mixed with activated sludge is agitated in an

agitation zone, whereafter a portion of the mixture is directed to a settling zone in which sludge is settled



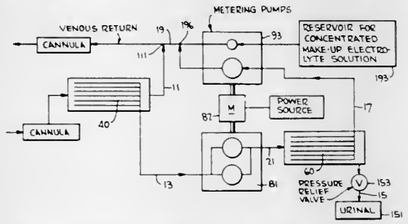
out, and the remainder of the mixture is directed to an aeration.

3,579,440
SEWAGE TREATMENT SYSTEM
William E. Bradley, Jr., Atlanta, Ga., assignor to Tesco Chemicals, Inc., Atlanta, Ga.
Filed Dec. 4, 1969, Ser. No. 882,016
Int. Cl. C02b *3/06*
U.S. Cl. 210—18 **9 Claims**



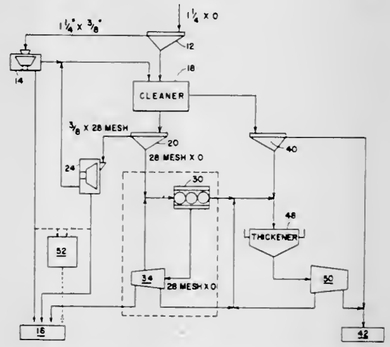
Method and apparatus for treating household waste water wherein raw sewage is decomposed with an aerobic process in a septic tank and chlorine is added to the wastewater after it is discharged from the septic tank.

3,579,441
BLOOD PURIFICATION BY DUAL FILTRATION
Clinton E. Brown, Silver Spring, Md., assignor to Hydronautics, Incorporated, Laurel, Md.
Filed Apr. 19, 1968, Ser. No. 722,727
Int. Cl. B01d *31/00, 13/00*
U.S. Cl. 210—23 **25 Claims**



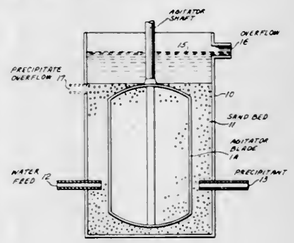
An extra-corporeal device employing filtration means performs the functions of a natural kidney in the following manner: arterial blood is filtered by a highly selective filtration means which retains macromolecular weight blood constituents such as blood cells, fat droplets, high molecular weight polypeptides and high molecular weight lipids, while permitting the passage of water and low molecular weight solutes. The water and solutes are then passed through a second filtration means or combination of filtration and electrodialyzing means which permits only the passage of pure water or pure water and electrolytes. The purified filtrate from this second stage is then combined with a controlled amount of make-up electrolyte solution, and this combined solution is then mixed with the macromolecular weight blood constituents retained by the first filtration means to form the venous return.

3,579,442
COAL CONVERTING PROCESS
Jack N. Gerwig, South Charleston, W. Va., assignor to Bird Machine Company, South Walpole, Mass.
Filed July 9, 1970, Ser. No. 53,508
Int. Cl. B01d *37/04*
U.S. Cl. 210—44 **10 Claims**



A process for converting coal containing refuse to a useable coal product of a predetermined maximum moisture content, comprising the steps of separating wet, refuse-containing coal into fractions according to particle size, including a finest fraction and one or more larger fractions, removing refuse at least from the larger fractions, dewatering the larger fraction to a moisture content below the predetermined maximum, and mechanically dewatering the finest fraction in a continuous centrifuge constructed to provide a finest coal output having a moisture content above the predetermined maximum which, when the fractions are all recombined, will provide a combined moisture content within the predetermined maximum to form said product.

3,579,443
FORMATION OF DENSE PRECIPITATES
Russell J. Horst, 1631 Chippendale Circle, Bethlehem, Pa. 18017
Continuation-in-part of application Ser. No. 749,463, Aug. 1, 1968. This application July 31, 1969, Ser. No. 846,556
Int. Cl. B01d *21/08*
U.S. Cl. 210—49 **24 Claims**

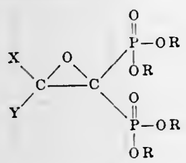


In a process for precipitating dense precipitates from an aqueous solution of iron and mixtures of iron with

other metals, the solution is introduced into a vessel containing a moving bed of a material such as sand in a water medium. Simultaneously, a solid or a liquid precipitant is introduced into the vessel, and the heavy metals, precipitating from the resultant reaction, deposit on the individual particles of the sand bed. The precipitate thus formed is dense and low in retained water. A clean water effluent, substantially free of dissolved heavy metals, is removed from the vessel.

3,579,444
METHODS OF SCALE INHIBITION
Al F. Kerst, Littleton, Colo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Apr. 13, 1970, Ser. No. 27,983
Int. Cl. C02b *5/06*
U.S. Cl. 210—58 **11 Claims**

The precipitation of scale-forming salts in an aqueous system is inhibited by adding either stoichiometric or substoichiometric amounts to said system of an organo-phosphorous compound which is a substituted epoxy ethane polyphosphonic acid or its salt, said organo-phosphorus compound having the formula



wherein R is hydrogen or a metal ion, and X and Y are hereinafter defined.

3,579,445
METHOD OF AND COMPOSITION FOR THE TREATMENT OF SCALE
Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.
No Drawing. Filed June 24, 1968, Ser. No. 739,207
Int. Cl. C02b *5/06*
U.S. Cl. 210—58 **7 Claims**

Method of and composition for the treatment of scale, particularly calcium sulfate scale, using a quaternary trimethylalkyl ammonium halide, acetate, sulfate or hydroxide containing 8 to 20 carbon atoms in the alkyl group including mixtures.

3,579,446
FIRE-EXTINGUISHING FOAM COMPOSITION INCLUDING A BASIC, NITROGENOUS COMPOUND
Hermann Kroke, Erkrath-Unterbach, and Kurt Raffalsky, Urach, Wurttemberg, Germany, assignors to Minimax Aktiengesellschaft, Urach, Wurttemberg, and Henkel & Cie. G.m.b.H., Dusseldorf, Germany
No Drawing. Filed Mar. 24, 1969, Ser. No. 809,945
Claims priority, application Austria, Apr. 29, 1968, A 4,153/68
Int. Cl. A62d *1/00*
U.S. Cl. 252—3 **11 Claims**

In a foaming composition useful as a fire extinguisher composed of

(1) A foaming agent such as substituted or unsubstituted alkyl or alkyl-ether sulfate;
(2) A stabilizing additive to improve the water-retaining capacity of the foam, such as higher aliphatic alcohol or ether containing from 8 to 25 carbon atoms, or a higher aliphatic alcohol containing a few alkylene oxide molecules;
(3) Optionally, a compensating agent, which aids in production of foams with reduced weight and of lower discharge velocities, such as monovalent polyether alcohols;

the improvement comprising the use of water-soluble, basic, organic or inorganic nitrogenous compound which neutralizes corrosive effects of halides in the combustion gases.

3,579,447
METHOD OF REMOVING COPPER DEPOSITS FROM FERROUS METAL SURFACES USING HYDROXYALKYL THIOUREA
Thaddeus M. Muzyczko, Melrose Park, William J. Ludwig, Westmont, Jon A. Loboda, Chicago, and Samuel Shore, Roselle, Ill., assignors to The Richardson Company, Melrose Park, Ill.
No Drawing. Filed Sept. 30, 1968, Ser. No. 763,914
Int. Cl. C02b *5/06;* **C07c** *157/02;* **C23g** *1/06*
U.S. Cl. 252—8.7 **12 Claims**

Removal of copper-containing incrustations from ferrous metal surfaces accomplished in improved manner by addition of a hydroxyalkyl thiourea having at least two carbon atoms in the alkyl group such as 1-hydroxyethyl-3-methyl thiourea to an aqueous treating solution and subsequent treatment of ferrous metal surfaces wherein reduced sludge formation accompanies removal of copper and the avoidance of copper plating.

3,579,448
GREASE COMPOSITION
Alvin Harrison, Irvington, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.
No Drawing. Filed June 25, 1968, Ser. No. 739,634
Int. Cl. C10m *7/26, 7/24*
U.S. Cl. 252—28 **5 Claims**

A grease composition consisting of a synthetic ester thickened to a grease-like composition with bentonite clay, wherein a pyrogenic silica gelling agent is added thereto.

3,579,449
LUBRICANT COMPOSITION
Robert Earl Wann, Denzel Allan Nicholson, and Ted Joe Logan, Hamilton, Ohio, assignors to the Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Sept. 26, 1968, Ser. No. 762,966
Int. Cl. C10m *1/46, 1/30*
U.S. Cl. 252—49.5 **8 Claims**

Lubricant compositions comprising a major amount of a lubricating base fluid and a minor amount of extreme pressure additives which contain either a methylene, monohalomethylene or dihalomethylene group between two moieties selected from the group consisting of phosphono, dihydrocarbylphosphoryl, phenyl, substituted phenyl, keto, cyano, and carboxylate ester moieties.

3,579,450
LUBRICANTS AND FUELS CONTAINING EPOXIDE TREATED ESTERS
William M. Lesuer, Cleveland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio
No Drawing. Continuation of application Ser. No. 712,606, Mar. 13, 1968, which is a continuation-in-part of applications Ser. No. 567,052, now Patent No. 3,522,179, and Ser. No. 567,320, now Patent No. 3,381,022, both July 22, 1966. This application Oct. 3, 1969, Ser. No. 866,084
Int. Cl. C10m *1/26*
U.S. Cl. 252—56 **19 Claims**

A process for post-treating oil-soluble esters of mono- or polycarboxylic acids and polyhydric alcohols with organic epoxides. The acyl moiety of the esters is derived from mono- or polycarboxylic acids containing at least about fifty aliphatic carbon atoms exclusive of the carboxyl carbon atoms. The products are useful as lubricant and fuel additives. A typical example of the process would be the post-treatment of a diester of polyisobutenyl-substituted succinic acid and sorbitol with propylene oxide.

3,579,451
ELECTROPHOTOGRAPHIC DEVELOPER MADE FROM CROSS-LINKED SILICONE INTERMEDIATE RESIN
Louis J. Sciambi, Wenonah, N.J., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Continuation-in-part of application Ser. No. 582,541, Sept. 28, 1966. This application Jan. 22, 1969, Ser. No. 793,152
Int. Cl. G03g *9/02, 9/04*
U.S. Cl. 252—62.1 **3 Claims**

The method of preparing a stable, dry electrophotographic developer composition concentrate consists essentially of admixing and suspending about one part by weight of a silicone intermediate resin with from about one to five parts by weight of a cross-linking promoting catalyst in an aromatic carrier liquid and heating the admixture at a temperature of from about 50 to 100° C. for a period of about 1 to 24 hours; admixing the heated admixture with from about 0.5 to 4 parts by weight of an insoluble solid pigment per part of resin plus catalyst present (solvent-free basis); milling the resin-catalyst and pigment mixture together in a grinding mill for at least about 8 hours; and evaporating the solvent from the so-milled admixture.

The dry concentrate is made into a liquid concentrate by milling the dry solids for from about 8 to 24 hours with sufficient organic carrier liquid, such as a liquid aliphatic hydrocarbon, to provide a suitable grinding slurry viscosity. This milled liquid concentrate is diluted further with carrier liquid to provide the proper concentration of catalyst per liter of composition as well as an electrical conductivity within the desired range and the so-diluted mixture is a working electrophotographic developer composition.

3,579,452
PROCESS FOR THE PRODUCTION OF FERROMAGNETIC PURE OR ISOTYPE MANGANATE MIXED PHASES CRYSTALLIZING IN THE ILMENITE LATTICE
Franz Hund, Krefeld-Bockum, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Aug. 28, 1968, Ser. No. 755,937
Claims priority, application Germany, Sept. 1, 1967, F 53,389
Int. Cl. C01g *45/12*
U.S. Cl. 252—62.51 **9 Claims**

Production of ferromagnetic pure and isotype manganate mixed phases of the composition

$$Ni_{1-x}Co_x \cdot 0.91\text{–}1.1\ MnO_3;$$

where $0 \leq x \leq 0.20$ that crystallize in the ilmenite lattice, by precipitating such mixed phase constituens from an aqueous salt solution of manganese and nickel, or manganese, nickel and cobalt, ions, in quantitative proportions which correspond directly to those of the required end compound, by instantly intermixing such reactants with a basic precipitant at about 0–100° C., oxidizing the resllting suspension, and then filtering, washing, calcining and cooling the resulting precipitate.

3,579,453
ALKALI-SOLUBLE SURFACTANT CONSISTING OF SUBSTITUTED SUCCINIC ACID-NONIONIC ETHOXYLATE BLENDS
Jean Dupre, Levittown, and Harrison Scott Killam, Holland, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,137
Int. Cl. C11d *1/66*
U.S. Cl. 252—89 **8 Claims**

Nonionic ethoxylated surfactants, which are known to be very desirable components in heavy duty cleaning products, suffer from the fact that they have limited solubility in solutions of alkaline electrolytes and thus are not soluble in alkaline builder concentrates. Addition of moderate amounts of substituted succinic acids overcomes this defect and permits the inclusion of these nonionics in built liquid detergent concentrates.

3,579,454
DETERGENT COMPOSITIONS CONTAINING AN OXIDIZING BLEACH AND PROTEOLYTIC ENZYME DERIVED FROM THERMOPHILIC *STREPTOMYCES RECTUS* VAR. *PROTEOLYTICUS*
Everett J. Collier, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Continuation-in-part of abandoned application Ser. No. 777,485, Nov. 20, 1968. This application Aug. 15, 1969, Ser. No. 850,656
Int. Cl. C11d *9/42*
U.S. Cl. 252—97 **7 Claims**

Detergent composition containing an organic synthetic detergent and an alkaline builder in a weight ratio of about 1:30 to about 5:1, an oxidizing bleach and a proteolytic enzyme derived from thermophilic *Streptomyces rectus* var. *proteolyticus* ATCC 21067. These compositions are useful in any application where the combined effect of an oxidizing bleach and proteolytic enzyme activity are desired, such as laundering and soaking compositions.

3,579,455
MACHINE DISHWASHING COMPOSITIONS CONTAINING SODIUM POLYACRYLATE
Philip M. Sabatelli, Cincinnati, Ohio, and Charles A. Brungs, Covington, Ky., assignors to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed Aug. 2, 1968, Ser. No. 749,592
Int. Cl. C11d *7/14, 7/16, 7/26*
U.S. Cl. 252—135 **5 Claims**

A machine dishwashing composition is disclosed which includes alkali metal carbonate, a tetra-alkali metal pyrophosphate, an alkali metal hexametaphosphate, a water-soluble salt of polyacrylic acid, and an alkali metal metasilicate. Cooking and eating utensils may be cleaned by a low foaming aqueous solution of the present machine dishwashing composition with less spotting and greater clarity.

3,579,456
LIQUID DETERGENT COMPOSITION
Cushman M. Cambre, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Dec. 18, 1968, Ser. No. 784,886
Int. Cl. C11d *3/08, 3/14*
U.S. Cl. 252—137 **6 Claims**

Stable, liquid detergent compositions (for cleaning aluminum and rust stains from hard surfaces) containing

particulate materials (e.g., abrasives), water, alkylbenzenesulfonate detergent, zwitterionic synthetic detergent and an acid electrolyte; said compositions have a pH of from about 1 to about 5.

3,579,457

EPOXIDE TAURINE CONDENSATION PRODUCTS AND DETERGENT COMPOSITIONS CONTAINING THEM

Robert M. Lincoln, Moylan, and Joseph A. Meyers III, Springfield, Pa., and Richard W. Sauer, Cherry Hill, N.J., assignors to Atlantic Richfield Company, New York, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 625,281, Mar. 23, 1967, which is a continuation-in-part of application Ser. No. 548,876, May 10, 1966. This application Apr. 2, 1969, Ser. No. 812,919

Int. Cl. C11d *3/34*

U.S. Cl. 252—137 **3 Claims**

Novel condensation products wherein a C_3–C_5 aliphatic epoxide and a C_3–C_{18} aliphatic epoxide are condensed with taurine, and built synthetic detergent compositions wherein at least a portion of the sodium tripolyphosphate is replaced by this epoxide-taurine condensation product.

3,579,458

COMPOSITION OF MATTER

Joseph E. Callen and Robert D. Haxby, Springfield Township, Hamilton County, and William T. Fagin, Colerain Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Continuation-in-part of application Ser. No. 517,941, Jan. 3, 1966. This application May 8, 1968, Ser. No. 727,654

Int. Cl. C11d *3/42*

U.S. Cl. 252—152 **8 Claims**

A composition consisting essentially of certain relatively water insoluble brighteners essentially completely dissolved in an acidic solvent which forms a detergent when it is neutralized; processes for preparing said composition; and the corresponding neutralized composition.

3,579,459

METAL VAPOR GENERATING COMPOSITIONS

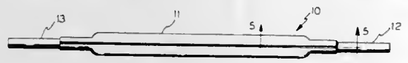
Paolo Della Porta and Elio Rabusin, Milan, Italy, assignors to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Dec. 13, 1967, Ser. No. 690,125

Claims priority, application Italy, Dec. 13, 1966, 31,040/66; Oct. 12, 1967, 21,538/67

Int. Cl. C09k *3/00;* **H01v** *39/22*

U.S. Cl. 252—181.4 **24 Claims**



(A) an open sitered matrix of a sinterizable material in a vacuum releases a metal vapor. The structure comprises

(A) an open sintered matrix of sinterizable material and,

(B) a mixture, fixedly held within the sintered matrix, said mixture comprising:

(1) a compound of a metal selected from the group consisting of mercury and the alkali metals said compound being reducible to its metal, and,

(2) a stoichiometric excess of a reducing agent for said compound.

Devices employing these composite structures and processes for producing these structures.

3,579,460

SULFENAMIDE COMPOSITIONS STABILIZED BY ORGANIC DISULFIDES

Joseph Edward Kerwood, 2886 Burr Oak Drive, Akron, Ohio 44313

No Drawing. Filed June 16, 1969, Ser. No. 833,736

Int. Cl. C08d *11/02*

U.S. Cl. 252—182 **15 Claims**

A composition comprising a thiazolesulfenamide accelerator and a sulfenamide prevulcanization inhibitor can be stabilized by the addition of an organic disulfide of the formula T—S—S—T wherein T independently is lower alkyl, aralkyl, aryl, alkenyl or a 2-thiazolyl radical.

3,579,461

EMULSIFICATION PROCESS

Wayne R. Glaub, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Nov. 20, 1967, Ser. No. 684,436

Int. Cl. B01j *13/00*

U.S. Cl. 252—311 **9 Claims**

An improved process for manufacturing a wax emulsion under pressure is described According to the process, the wax and a minor amount of the total water used in the emulsion are added to the pressure vessel and heated under pressure. An emulsifier is added, preferably beneath the surface of the wax/water concentrate, with agitation to obtain uniformity and provide a water-in-wax emulsion. The emulsion is diluted rapidly with sufficient water being added beneath the surface to obtain a wax-in-water emulsion.

3,579,462

TREATMENT OF SILICA SOLS

Henry Thomas Joseph Chilton and Patricia Gertrude Burns, Llangollen, Denbigshire, Wales, assignors to Monsanto Chemicals Limited, London, England

No Drawing. Filed Sept. 6, 1968, Ser. No. 758,116

Claims priority, application Great Britain, Sept. 12, 1967, 41,593/67

Int. Cl. B01j *13/00;* **C01b** *33/14*

U.S. Cl. 252—313S **14 Claims**

A process for the isolation, from an initial silica sol having a relatively wide range of particle sizes, of one or more fractions in each of which the particle size of the silica is relatively uniform, which comprises placing the initial silica sol on a permeable bed of a porous gel, which gel comprises a solid phase substantially insoluble in the liquid dispersion medium of the silica sol, and a liquid phase which is the same as or is compatible with the liquid dispersion medium, the gel having an average pore size comparable with the average particle size of the silica, washing the silica through the bed with an eluant which is the same as or compatible with the liquid dispersion medium of the initial sol and with the liquid phase of the gel and collecting as an effluent from the bed at least one fraction of colloidally dispersed silica in which the range of particle size is less than that in the initial silica sol.

3,579,463

METHOD OF PREPARING CRYSTALLINE CALCIUM HALOPHOSPHATE PHOSPHOR

Anselm Wachtel, Parlin, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 7, 1969, Ser. No. 822,501

Int. Cl. C09k *1/36*

U.S. Cl. 252—301.4 **8 Claims**

Method of preparing crystalline calcium halophosphate of a particle size distribution which can be advantageously used in commercial fluorescent lamps. A raw mix is prepared of the constituents required to form the calcium halophosphate matrix with an excess of calcium and halogen constituents in predetermined amounts. The firing is carried out at a predetermined temperature and time to form the halophosphate matrix having the desired crystallinity and particle size distribution. Then, a selected amount of activator constituent is mixed with the halophosphate matrix and is incorporated into the matrix during a subsequent firing to form the phosphor.

3,579,464

NONDECREPITATING SILICA GEL AND METHOD FOR ITS PREPARATION

Harvey Rosen, Laurel, and Ellsworth G. Acker and Hanju Lee, Baltimore, Md., assignors to W. R. Grace & Co., New York, N.Y.

No Drawing. Filed May 20, 1968, Ser. No. 730,620

Int. Cl. B01j *13/00;* **C01b** *33/16;* **C09k** *3/00*

U.S. Cl. 252—317 **10 Claims**

Conventional partially dried silica hydrogel particles having about 2–20% moisture content are ground to about 1–500 microns. This powder is then blended with silica hydrosol solution in proportions such that the weight ratio of silica from the hydrogel particles to silica in the hydrosol is about 15:11. The resultant mixture is then extruded, beaded, pelleted or otherwise shaped. The thus shaped products are then aged, washed, dried and activated.

3,579,465

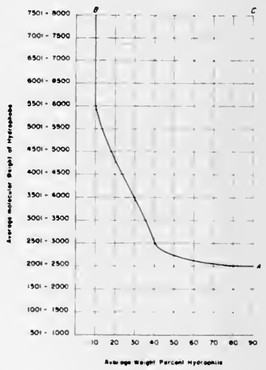
AQUEOUS GELS OF POLYOXYETHYLATED POLYOXYPROPYLENE GLYCOL ADDUCTS OF ETHYLENE DIAMINE

Irving R. Schmolka, Grosse Ile, Mich., assignor to Wyandotte Chemicals Corporation, Wyandotte, Mich.

Filed Oct. 16, 1967, Ser. No. 675,505

Int. Cl. A01n *9/00;* **A61k** *7/00;* **B01j** *13/00*

U.S. Cl. 252—316 **6 Claims**



Aqueous gels, useful in the formulation of pharmaceutical, cosmetic and detergent compositions, are prepared from certain polyoxyethylated polyoxypropylene glycol adducts of ethylene diamine.

3,579,466

POLYGLYCIDYL POLYMERS AS DEMULSIFIERS

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, Wilmington, Del.

No Drawing. Original application Mar. 8, 1965, Ser. No. 438,115. Divided and this application Jan. 17, 1969, Ser. No. 792,157

Int. Cl. B01d *17/04*

U.S. Cl. 252—331 **14 Claims**

A process of demulsification which employs polyglycidyl polymers and copolymers thereof and derivatives thereof as demulsifiers.

3,579,467

ORGANOPOLYSILOXANES HAVING HYDROXYARYL SUBSTITUENTS

Edgar D. Brown, Jr., Schenectady, N.Y., assignor to General Electric Company

No Drawing. Continuation-in-part of application Ser. No. 600,787, Dec. 12, 1966. This application Nov. 27, 1968, Ser. No. 779,622

Int. Cl. C10m *1/50*

U.S. Cl. 252—46.3 **11 Claims**

Organopolysiloxanes useful as hydraulic fluids comprise organopolysiloxanes in which a majority of the siloxane groups contain methyl radicals and higher alkyl radicals, and a minor proportion of the siloxane groups contain silicon-bonded tertiary butyl-substituted hydroxyaryl radicals attached to silicon through a divalent propylene radical. Optionally, a minor amount of aryl and aralkyl radicals can also be present on the siloxane groups. These compounds are prepared by reacting polysiloxanes containing methylhydrogen units and phenylhydrogen units with higher alkenes and hydroxyaryl compounds containing both nuclear substituted allyl radicals and nuclear substituted tertiary butyl radicals.

3,579,468

PROCESS FOR RECONSTITUTING NATURAL CITRONELLA OIL

Robert P. T. Young, Ponte Vedra, Fla., assignor to SCM Corporation, New York, N.Y.

No Drawing. Filed Aug. 26, 1966, Ser. No. 575,238

Int. Cl. C11b *9/00, 9/02*

U.S. Cl. 252—522 **1 Claim**

Reconstituted citronella oil in which at least a portion of the naturally occurring d-citronellal in the natural oil is replaced by substantially equivalent weight proportion of dl-citronellal is described. The reconstituted citronella oil has substantially the same odor value as that of the natural citronella oil. Processes for preparing this product are also described. The invention is advantageous in that it provides d-citronellal which would not otherwise be available and which is useful in making hydroxy citronellal, a perfumery chemical and is also advantageous in that it extends the supply of citronella oil.

3,579,469

SILOXANE PAPER RELEASE COATINGS

Maurice E. Grenoble, Ballston Lake, N.Y., assignor to General Electric Company

No Drawing. Filed Dec. 13, 1968, Ser. No. 783,773

Int. Cl. C08k *1/66*

U.S. Cl. 260—18 **5 Claims**

A paper release coating composition contains a silanol-terminated polysiloxane gum, a silane of the formula $HSiX_3$, where X is a hydrolyzable radical, a metal salt and an organic solvent. A surface of a sheet of paper is coated with the composition, the solvent is evaporated, and the silanol-terminated polysiloxane is cross-linked by reaction with the silane in the presence of moisture at an elevated temperature. The coated paper produced is useful as a backing sheet for bumper stickers.

3,579,470

DIPHENYL OXIDE MODIFIED PHENOLIC RESIN INSULATING VARNISHES

Robert H. Runk, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

No Drawing. Continuation of applications Ser. No. 394,312, Sept. 5, 1964, and Ser. No. 706,706, Feb. 19, 1968. This application Dec. 30, 1968, Ser. No. 800,313

Int. Cl. C08g *37/20*

U.S. Cl. 260—20 14 Claims

Monomeric monofunctional chloromethyl diphenyl oxide and/or alkoxy methyl diphenyl oxide is reacted with a substantially equimolar amount of a phenol. The product is further reacted with formaldehyde to form a resole that that may be converted to a cross-linked polymer by the application of heat. The resole resins may be blended with modifying compositions such as epoxy esters and/or oil modified alkyds and the like.

3,579,471

CELL MODIFYING AGENTS FOR POLYURETHANE FOAMS

Willem Dijkhuizen, Harmannus Kliphuis, and Jan Lolkema, Hoogezand, Netherlands, assignors to Scholten Research N.V., Groningen, Netherlands

No Drawing. Filed Oct. 18, 1967, Ser. No. 676,085

Claims priority, application Great Britain, Oct. 22, 1966, 47,454/66

Int. Cl. S08g *22/44, 53/08*

U.S. Cl. 260—2.5 21 Claims

Polyurethane foams having improved physical properties are provided herein by producing the foams in the presence of cell modifying agents, at least one of which is an organic high molecular weight emulsifying agent substantially soluble in mineral oil but substantially insoluble in water, and which emulsifying agent is capable of producing heat-stable water-in-oil emulsions. The emulsifying properties of these new cell modifying agents are such that upon subjecting 20 cm.^{3} of 0.5% solution of said emulsifying agent in a mineral oil of a viscosity of 1–5° Engler at 20° C. to the A.S.T.M. "Steam Emulsion Test"; the time for separating 5 cm.^{3} of one of the phases of the emulsion at a temperature of 93° C. to 95° C. is at least 20 minutes.

3,579,472

METHOD OF FABRICATING EXPANDABLE THERMO-PLASTIC RESINOUS MATERIAL

Louis C. Rubens and William B. Walsh, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 526,358, Feb. 10, 1966, which is a continuation-in-part of application Ser. No. 439,969, Mar. 15, 1965. This application May 31, 1968, Ser. No. 733,231

Int. Cl. C08f *1/16, 7/06, 47/10*

U.S. Cl. 260—2.5 8 Claims

Replicating foam plastic bodies are prepared by polymerization at room temperature of chlorostyrene, methyl methacrylate, a cross-linking agent and a blowing agent, without requiring a closed mold or vessel.

3,579,473

EPOXY SOLDERS

George A. Salensky, Metuchen, N.J., assignor to Union Carbide Corporation, New York, N.Y.

No Drawing. Filed Dec. 27, 1968, Ser. No. 787,555

The portion of the term of the patent subsequent to June 10, 1986, has been disclaimed

Int. Cl. C09g *51/06, 51/04, 31/12*

U.S. Cl. 260—18 13 Claims

This invention relates to epoxy solders, containing a talc of specified properties, which are characterized by excellent thermal shock resistance, and cure speed and adhesion to oil contaminated surfaces.

3,579,474

ELASTOMERIC COPLYMERS OF TETRAFLUOROETHYLENE CONTAINING PHENOXYETHYL GROUPS, AND THEIR VULCANIZATION

Rolland S. Ro, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Dec. 16, 1968, Ser. No. 784,234

Int. Cl. C08f *19/04, 45/24*

U.S. Cl. 260—29.6 10 Claims

Novel elastomeric copolymers of tetrafluoroethylene with (1) (a) an alkyl vinyl ether, or either (b) an olefin which is from 50 to 100 mole percent of propylene, butene-1 or a mixture of them, any remainder being ethylene or isobutylene, or (c) ethylene and isobutylene in about equimolar proportions, and (2) 0.5 to 5 percent by weight of the product of a cure-site monomer which is an aryloxyalkyl vinyl ether, are made by catalytically uniting the components in an inert medium. The copolymer products are cleanly, quickly and efficiently cured by mixing with small amounts of polyformaldehyde or methylol-containing condensation products of formaldehyde with urea, phenol, or melamine under nonbasic, preferably acidic, conditions to form novel elastomeric products having improved elastic properties.

3,579,475

CROSS-LINKED POLY(ARYLSULPHONE ETHERS)

Michael Edward Benet Jones, 45 Richmond Crescent, Vicars Cross, Chester, England, and Brian Edmund Jennings, Cherry Acre, 40 Harmer Green Lane, Digswell, Welwyn, Hertfordshire, England

No Drawing. Continuation of application Ser. No. 755,492, Aug. 7, 1968. This application Feb. 17, 1970, Ser. No. 12,141

Int. Cl. C08g *25/00*

U.S. Cl. 260—37 9 Claims

A thermoplastic polymer containing aromatic residues in the polymer chain is cross-linked by heating with an aromatic compound containing at least two sulphonyl chloride, bromide, hydrazide or ester groups. The thermoplastic polymer may itself contain at least two of these reactive sulphonyl groups per chain and can be cross-linked on heating alone.

3,579,476

GLASS FILLED GRAFT COPOLYMERS OF AN OLEFIN AND AN UNSATURATED ACID

James K. Rieke and Frank H. Justin, Midland, Mich., assignors to Dow Chemical Company, Midland, Mich.

No Drawing. Continuation-in-part of application Ser. No. 531,381, Mar. 3, 1966. This application Feb. 14, 1969, Ser. No. 799,487

Int. Cl. C08f *45/10*

U.S. Cl. 260—41 11 Claims

Polymer compositions having improved tensile properties and improved impact resistance comprising a blend of between about 10 and about 40 weight percent glass fibers and between about 60 and about 90 weight percent of a graft copolymer of an olefin such as ethylene and an ethylenically unsaturated carboxylic acid such as acrylic acid. The polymer compositions can be molded or extruded to produce useful articles of manufacture including gears, sprockets, washing machine agitators, gear housings, and the like.

3,579,477

POLYESTER COATING AND MOLDING COMPOSITION

Samuel P. Vess, Marfa, Tex., assignor to Decor Dimensionals, Inc., Greenville, Tex.

No Drawing. Filed Sept. 3, 1968, Ser. No. 757,104

Int. Cl. C08k *1/02*

U.S. Cl. 260—40 29 Claims

A composition and method for forming semi-flexible and rigid polyester articles and coatings which are vapor-

permeable and liquid impervious. The compositions comprise mixtures of polyesters, expanded mineral fillers and a monomeric polymerizable solvent.

3,579,478

POLYOLEFIN STABILIZATION

Howard E. Dunn and Ronald D. Mathis, Bartlesville, Okla., assignors to Phillips Petroleum Company

No Drawing. Filed Jan. 6, 1969, Ser. No. 789,384

Int. Cl. C08f *45/62*

U.S. Cl. 260—45.75 7 Claims

Minor amounts of nickel complexes of the type

$$(R_2NCH_2CH_2S)_2Ni$$

wherein R is hydrogen or a hydrocarbon radical, are incorporated into solid homopolymers or copolymers derived from olefins having from 2 to 6 carbon atoms per molecule for protection against the deteriorating effects of ultraviolet light.

3,579,479

3-ENDO-METHYL - 3 - EXO(4′ - METHYL - 5′-HYDROXYPENTYL)NORCAMPHOR AND 2-METHYL-5-BROMOPENTANOL, AND PROCESS FOR THE PREPARATION OF THESE COMPOUNDS

Wayne I. Fanta and William F. Erman, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Mar. 29, 1968, Ser. No. 717,360

Int. Cl. C07c *49/27*

U.S. Cl. 260—586 12 Claims

The novel compounds, 2-methyl-5-bromopentanol and 3-endo-methyl-3-exo(4′ - methyl - 5′ - hydroxypentyl) norcamphor and the process for preparing 2-methyl-5-bromopentanol and 3 - endo-methyl-3-exo(4′-methyl-5′-hydroxypentyl)norcamphor from 2 - methyl-4-pentenol comprising the steps of (1) borating 2-methyl-4-pentenol with boric acid and/or boric anhydride to obtain tri (2-methyl-4-pentenyl)borate; (2) hydrobrominating the tri(2-methyl-4-pentenyl)borate in the presence of a free radical catalyst and, subsequently, hydrolyzing the reaction product to obtain 2-methyl-5-bromopentanol; (3) borating the 2-methyl-5-bromopentanol with boric acid and/or boric anhydride to obtain tri(2-methyl-5-bromopentyl)borate; (4) alkylating 3 - methylnorcamphor with the tri(2-methyl-5-bromopentyl)borate and, subsequently, hydrolyzing the reaction product to obtain 3-endo-methyl-3-exo(4′-methyl-5′-hydroxypentyl)norcamphor.

3,579,480

CATALYST SYSTEM FOR POLYMERIZING SATURATED, ALIPHATIC ALDEHYDES

Henricus Gerardus Josef Overmars, Zeist, and Jan Gerrit Noltes, Utrecht, Netherlands, assignors to International Lead Zinc Research Organization, Inc., New York, N.Y.

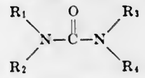
No Drawing. Filed June 5, 1968, Ser. No. 734,577

Claims priority, application Netherlands, June 20, 1967, 6708558

Int. Cl. C08g *1/06, 1/08*

U.S. Cl. 260—67R 11 Claims

A catalyst system for polymerizing or copolymerizing aldehydes, comprising a mixture of (1) dialkylzinc, (2) a co-catalyst, such as alcohol, amine, or water, and (3) a stabilizing agent having the formula



wherein each R represents hydrogen, alkyl, cycloalkyl, aralkyl, or aryl radicals, and when R_1, R_2 and R_3=hydrogen, R_4 contains at least three carbon atoms.

3,579,481

CATALYST SYSTEM FOR POLYMERIZING SATURATED, ALIPHATIC ALDEHYDES

Henricus Gerardus Josef Overmars, Zeist, and Jan Gerrit Noltes, Utrecht, Netherlands, assignors to International Lead Zinc Research Organization, Inc., New York, N.Y.

No Drawing. Filed June 5, 1968, Ser. No. 734,576

Claims priority, application Netherlands, June 20, 1967, 6708558

Int. Cl. C08g *1/06, 1/08*

U.S. Cl. 260—67R 12 Claims

A catalyst system for polymerizing or copolymerizing aldehydes, comprising a mixture of (1) dialkylzinc, (2) a co-catalyst, such as alcohol, amine, or water, and (3) a stabilizing agent having the formula Aryl—NR—CO—R′ wherein R represents hydrogen, alkyl, cycloalkyl, or aryl radicals, and R′ represents alkyl, aryl, alkoxy, aryloxy or carbamate radicals.

3,579,482

POLYMERS OF OLEFINICALLY UNSATURATED DIISOCYANATES (III)

Thomas K. Brotherton and John W. Lynn, Charleston, W. Va., assignors to Union Carbide Corporation

Division of application Ser. No. 409,921, Nov. 9, 1964, now Patent No. 3,427,346, which is a continuation-in-part of application Ser. No. 212,480, July 25, 1962. This application Apr. 2, 1968, Ser. No. 718,080

Int. Cl. C08g *22/18*

U.S. Cl. 260—77.5 14 Claims

Polyisocyanato-containing polymers obtained via the vinyl polymerization of unsaturated diester diisocyanates as exemplified by bis(2-isocyanatoethyl) fumarate with/without ethylenically unsaturated compounds, e.g., styrene, vinyl acetate, etc., which have utility in the manufacture of foamed products, coatings, reinforced plastic materials, and other areas.

3,579,483

ε-CAPROLACTAM CONTINUOUS POLYMERIZATION PROCESS

Ian C. Twilley, Chester, and William N. Russell and Weldon H. Peterson, Colonial Heights, Va., assignors to Allied Chemical Corporation, New York, N.Y.

Filed Apr. 15, 1969, Ser. No. 816,285

Int. Cl. C08g *20/14, 20/42*

U.S. Cl. 260—78 11 Claims

Apparatus and process for continuous polymerization of polyamides to produce a polymer wherein the required viscosity can be obtained much more rapidly and the extent of polymerization far greater than heretofore possible by use of a vacuum demoisturizing column within the polymerization train wherein the pre-polymer is converted to polyamide of higher molecular weight in a short period of time by exposing at least about 0.2 square foot of pre-polymer per pound thereof to a temperature of between about 230° C. and about 300° C. at pressures of less than about 500 mm. Hg. The apparatus and process yields even greater efficiencies when used in conjunction with polyamidation catalysts.

3,579,484

COMPOUNDING AIDS FOR THERMOSETTING ALLYLIC RESIN MOLDING COMPOUNDS

James Larue Thomas, Baltimore, Md., assignor to FMC Corporation, New York, N.Y.

Filed Mar. 18, 1968, Ser. No. 713,675

Int. Cl. C08f *3/60, 45/04*

U.S. Cl. 260—78.4 8 Claims

The compounding characteristics of thermosetting allylic resin molding compounds are improved by the addition of 1 to 100 parts per million, by weight based on resin,

of a metal, in chemically combined form, selected from the group consisting of magnesium, potassium, calcium, vanadium, chromium, manganese, iron, cobalt, nickel, copper, zinc, zirconium, molybdenum, antimony, tungsten, lead and cerium.

Addition of an effective amount of these selected metals causes a substantial improvement in compounding performance in terms of controllable uniform rate of viscosity increase during compounding and elimination of sticking to compoundng equipment without substantially altering the properties of the molding compound or the final molded product.

3,579,485
CHLORINATED CARBOXYL GROUP CONTAINING POLY-α-OLEFINS
Paul D. Folzenlogen, Windell C. Watkins, and Hugh J. Hagemeyer, Jr., Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Feb. 7, 1969, Ser. No. 797,700
Int. Cl. C08f *3/02, 3/04, 3/08*
U.S. Cl. 260—78.4D **19 Claims**

This invention relates to chlorinated carboxyl group containing poly-α-olefins which can be prepared by chlorinating a carboxyl group containing poly-α-olefin. These chlorinated poly-α-olefins form primer coatings for use on untreated poly-α-olefin substrates, which can be decorated by printing or painting.

3,579,486
MALEATED POLYOLEFINS
Richard L. McConnnell and Frederick B. Joyner, Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Filed Dec. 22, 1967, Ser. No. 692,703
Int. Cl. C08f *15/04, 27/04, 27/08*
U.S. Cl. 260—78.4 **7 Claims**

Normally available maleated polyolefins are improved by treating with a base to neutralize residues in the nature of maleic or fumaric acid; such bases include organic amines, metal hydroxides or metal alkoxides. The improved products have greater adhesion to paper, leather, fabrics, metal foils and other substrates, are generally free of toxic constituents and produce improved stereographic sheets and other coated objects.

3,579,487
POLYANHYDRIDE-MONOEPOXIDE COMPOSITIONS CONTAINING A MONOANHYDRIDE
Stanley M. Hazen, Cheswick, and William J. Heilman, Allison Park, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
Filed Oct. 19, 1967, Ser. No. 676,408
Int. Cl. C08f *15/00*
U.S. Cl. 260—78.5T **7 Claims**

Liquid coating and molding compositions are provided which are curable to an infusible resin article or coating. The composition comprises a solution of a saturated or unsaturated monooxirane compound, for example epichlorohydrin, a monoanhydride of a dicarboxylic acid containing at least 5 carbon atoms, such as phthalic anhydride and a solid polyanhydride having succinic anhydride groups (excluding aromatic anhydrides in which the α-carbon atoms of the anhydride group are included in the aromatic ring) for example the copolymer of a straight chain α-monoolefin and a maleic anhydride. Preferably a tertiary amine, such as 3-picoline, is included as a cure accelerator. The composition shows little or no shrinkage and weight loss during curing, in contrast to the same composition minus the mono-anhydride. Thus for example, films and coatings free of lifting and etching are obtained.

3,579,488
WATER-SOLUBLE COPOLYMERS OF ALKYLENIMINE AND ALKYLENE SULFIDE
Giffin D. Jones and Nancy B. Tefertiller, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Jan. 16, 1969, Ser. No. 791,806
Int. Cl. C08g *25/00*
U.S. Cl. 260—79 **6 Claims**

Water-soluble copolymers of a C_2–C_4 alkylenimine and a C_2–C_4 alkylene sulfide are obtained by an acid catalyzed copolymerization using as a catalyst about 3–15 mole percent based on total monomer of a strong water-soluble organic acid, preferably an aromatic sulfonic acid. The resulting water-soluble copolymers, having an average molecular weight of about 5–50 thousand contain about 10–40 mole percent copolymerized alkylene sulfide and are effective dispersants and dewatering agents in sewage treatment and also have flocculant activity.

3,579,489
POLYMERIZATION OF BETA-LACTONES
Willem M. Wagner, Amsterdam, Netherlands, assignor to Shell Oil Company, New York, N.Y.
No Drawing. Filed Dec. 20, 1968, Ser. No. 785,795
Claims priority, application Great Britain, July 1, 1968, 31,239/68
Int. Cl. C08g *17/02*
U.S. Cl. 260—78.3 **12 Claims**

The molecular weight distribution and heat stability of polylactones, particularly poly(beta-lactones), are controlled by polymerizing the lactones in the presence of an ionic initiator and certain chain-transfer agents such as alpha-halo-ketones and alpha-halo-aldehydes.

3,579,490
METHOD OF PRODUCING RESINS FOR USE IN ADHESIVES
Stanley Kordzinski, deceased, late of Old Bridge, N.J., by Eileen Kordzinski, executrix, Old Bridge, and Milton B. Horn, Plainfield, N.J., assignors to Ashland Oil & Refining Company, Ashland, Ky.
No Drawing. Continuation-in-part of abandoned application Ser. No. 20,822, Apr. 8, 1960. This application Aug. 31, 1964, Ser. No. 393,433
Int. Cl. C08f *15/14, 15/18, 15/20*
U.S. Cl. 260—80.72 **11 Claims**

A tacky and pressure sensitive adhesive comprising one or more aliphatic esters of acrylic, methacrylic and acetic acid together with one or more of glycidyl acrylate, glycidyl methacrylate or glycidyl allyl ether is disclosed. The proportions of monomeric ingredients are selected to give a calculated glass transition temperature from about −20° C. to about −55° C. The monomeric system is copolymerized at a temperature not exceeding about 100° C. in order to keep the glycidyl compounds intact during polymerization.

3,579,491
METHOD FOR PREPARING POLYMERS AND COPOLYMERS OF VINYL CHLORIDE BY BULK POLYMERIZATION AT LOW TEMPERATURE AND PRODUCTS THEREOF
Marc E. Carrega, Chatenay-Malaby, France, assignor to Produits Chimiques Pechiney-Saint-Gobain, Neuilly-sur-Seine, France
No Drawing. Filed Jan. 30, 1969, Ser. No. 795,347
Claims priority, application France, Feb. 7, 1968, 139,017
Int. Cl. C08f *3/30, 15/06*
U.S. Cl. 260—85.5 **11 Claims**

The polymerization and copolymerization of vinyl chloride in bulk, in the absence of oxygen and at a temperature within the range of −100° to 20° C. in the presence of a catalytic system comprising an alpha-halogenated diacyl peroxide and an organo aluminum compound.

3,579,492
METHOD FOR PREPARING LONG CHAIN ALKYL COMPOUNDS
William Novis Smith, Jr., Exton, Pa., assignor to Foote Mineral Company, Exton, Pa.
No Drawing. Filed Apr. 18, 1968, Ser. No. 722,179
Int. Cl. C08f *1/76, 3/06*
U.S. Cl. 260—94.9 **10 Claims**

Ethylene is polymerized in a solution of an n-butyllithium: N,N,N′,N′-tetramethylethylene diamine complex under temperature and pressure conditions selected from a narrow range of each until substantially all of the resulting polymer has precipitated from the solution as a long chain n-alkyllithium compound which may be converted to the corresponding polyethylene having a molecular weight from about 1500 to about 4000 with a Mw/Mn ratio of about 1.

3,579,493
POLYMERIZATION OF ETHYLENE USING REDUCED GROUPS IV–B, V–B AND VI–B METAL SALTS AS THE POLYMERIZATION CATALYST
Karl Ziegler, 1 Kaiser Wilhelm Platz, Muelheim (Ruhr), Germany, and Heinz Breil, Muelheim (Ruhr), Germany; said Breil assignor to said Ziegler
No Drawing. Filed Aug. 9, 1955, Ser. No. 527,412
Claims priority, application Germany, Aug. 13, 1954, Z 4,371; Aug. 14, 1954, Z 4,374
Int. Cl. C08d *3/04, 3/08*
U.S. Cl. 260—94.9 **13 Claims**

The polymerization of ethylene utlizing a catalyst formed by reducing a halide or acetylacetonate of a metal of Groups IV–B, V–B and VI–B of the periodic chart of the elements, including thorium and uranium, with an alkali metal or magnesium, or a mixture or an alloy thereof, or sodium-, lithium- or calcium hydride. The reduction agent may be in the form of a complex, as for example a complex compound with an organo boron compound. The catalyst may also be admixed with table salt.

3,579,494
C-SULFONATED TYROSYL PEPTIDES RELATED TO CHOLECYSTOKININ-PANCREOZYMIN (CCK-PZ)
Miguel A. Ondetti, North Brunswick, John T. Sheehan, Middlesex, and Josip Pluscec, East Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.
No Drawing. Filed July 18, 1968, Ser. No. 745,688
Int. Cl. C07c *103/52*
U.S. Cl. 260—112.5 **7 Claims**

Novel peptide amides of the general formula

R—Met—Gly—Trp—Met—Asp—Phe—NH_2

wherein R represents L-aspartyl-3′-sulfonyl-L-tyrosyl, L-aspartyl - L - arginyl - L - aspartyl-3′-sulfonyl-L-tyrosyl, or isoleucyl - L - seryl-L-aspartyl-L-arginyl-L-aspartyl-3′-sulfonyl-L-tyrosyl, and intermediates in the production thereof. The peptide amides of this invention as well as the pharmaceutically acceptable salts thereof have been found to possess cholecystokinin activity.

3,579,495
ISOLATION OF ORGOTEIN FROM BLOOD
Wolfgang Huber, San Francisco, Calif., assignor to Diagnostic Data, Inc., Palo Alto, Calif.
No Drawing. Continuation-in-part of application Ser. No. 815,175, Apr. 10, 1969, which is a continuation-in-part of application Ser. No. 728,777, May 13, 1968. This application Apr. 24, 1970, Ser. No. 31,791
Int. Cl. A61k *17/00;* **C07g** *7/04*
U.S. Cl. 260—115 **5 Claims**

Orgotein is isolated from lysed plasma-free erythrocytes by a series of steps which include removing the hemoglobin from the lysate, heating the remaining soluble proteins in the presence of buffer and divalent metal ion until the carbonic anhydrase is inactivated, removing the precipitate, and separating the orgotein protein from the supernatant liquid.

3,579,496
SELECTIVE EXTRACTION PROCESS PRODUCING PROTEIN ISOLATES FROM OILSEED MEALS USING WATER OR DIVALENT METAL SALTS AS EXTRACTING AGENTS
Wilda H. Martinez and Leah C. Berardi, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture
Filed July 17, 1969, Ser. No. 842,576
Int. Cl. A23j *1/14;* **C07g** *7/00*
U.S. Cl. 260—123.5 **26 Claims**

A process for extracting selectively protein fractions from oilseed flour which process comprises a preliminary extraction with water or a dilute (.008 M) polyvalent cationic salt solution and subsequently with aqueous base (.015 N sodium hydroxide).

The protein isolates thus extracted differ in composition, average molecular weight and solubility characteristics. With certain oilseeds, the disclosed process provides for the recovery of somewhat more of the total nitrogen from the flour being processed and for an improved flavor and color in the major isolate than does a conventional single-step alkaline extraction process.

3,579,497
WATER-INSOLUBLE MONOAZO DYESTUFFS
Visvanathan Ramanathan, Basel, and Klaus Artz, Muttenz, Switzerland, assignors to Ciba Limited, Basel, Switzerland
No Drawing. Filed Oct. 31, 1967, Ser. No. 679,522
Claims priority, application Switzerland, Nov. 7, 1966, 16,002/66
Int. Cl. C09b *29/06;* **D06p** *1/02*
U.S. Cl. 260—158 **10 Claims**

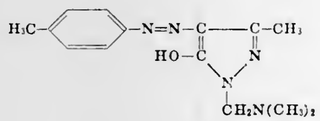
Water-insoluble monoazo dyestuffs of the formula

A—N=N—B

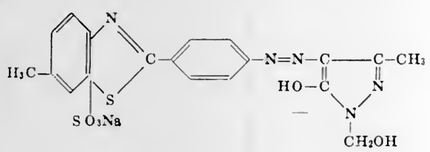
in which A represents a benzene radical or a heterocyclic radical and B represents a benzene radical containing an amino group in para-position to the azo group, one of the hydrogen atoms of the amino group being replaced by an alkyl radical that may be substituted and the other being replaced by a phenalkyl radical bearing a negative substituent. The compounds are suitable for dyeing and painting materials such as fibers and fabrics.

3,579,498
METHOD OF MAKING AZO, 3-SUBSTITUTED PYRAZOLONE DYES
William Paul Dunworth, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 594,352, Nov. 15, 1966. This application Nov. 6, 1967, Ser. No. 680,968
Int. Cl. C09b *29/38, 31/14, 33/12*
U.S. Cl. 260—158 **8 Claims**

Arylazo-, aryl disazo-, and benzothiazolylarylazo-1,3-substituted-5-pyrazolones, for example,



and



useful as paper dyes having good water solubility, bleachability, brightness, lightfastness and tinctorial strength, and as intermediates for cationic dyes which in turn are useful in dyeing acid modified acrylic, polyester and polyamide fibers.

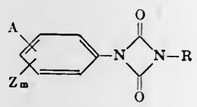
3,579,499
AMINO ALKYL ESTERS OF 5β-PREGN-20-ENE-21-CARBOXYLIC ACIDS AND THE 3-GLYCOSIDES THEREOF
Richard Clarkson, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed July 1, 1968, Ser. No. 741,241
Claims priority, application Great Britain, July 10, 1967, 31,671/67
Int. Cl. C07c *173/00*
U.S. Cl. 260—210.5 **5 Claims**

The disclosure relates to aminoalkyl esters of 5β-pregn-20-ene-21-carboxylic acids, processes for their manufacture, pharmaceutical compositions containing them and a method of using them to increase the force of contraction of the heart of warm-blooded animals. Representative of the steroid derivatives disclosed is 2-dimethylaminoethyl 3β-14β-dihydroxy-5β-pregn-20-ene - 21 - carboxylate.

3,579,500
1-ARYL-3-ALKYLURETIDINEDIONES
Arthur G. Jelinek, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed May 28, 1968, Ser. No. 732,558
Int. Cl. C07d *47/00*
U.S. Cl. 260—239 **9 Claims**

Compounds useful as herbicides of the formula:

(1)



where

A is hydrogen, halogen, alkyl, alkoxy, nitro, cyano, trifluoromethyl, p-chlorophenoxy or m-(tertiary butylcarbamoyloxy);

Z is hydrogen or halogen;

m is 1 or 2, and

R is alkyl, cycloalkyl, methylcyclohexyl, cyclohexylmethyl, cyclopentylmethyl, allyl, methallyl.

Typical is 1-(3,4-dichlorophenyl)-3-methyluretidinedione.

3,579,501
6-[α-(3 - GUANYL - 1 - UREIDO)PHENYL- OR THIENYL-ACETAMIDO]PENICILLANIC ACIDS
Donald Neil McGregor, Fayetteville, N.Y., assignor to Bristol-Myers Company, New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 780,557, Dec. 2, 1968. This application Aug. 22, 1969, Ser. No. 852,457
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 **16 Claims**

6-[α-(3-guanyl - 1 - ureido)phenylacetamido]- and 6-[α-(3-guanyl - 1 - ureido)thienylacetamido] - penicillanic acids are valuable as antibacterial agents, nutritional supplements in animal feeds, therapeutic agents in poultry and animals, including man, and are especially useful in the treatment of infectious diseases caused by Gram-positive and Gram-negative bacteria, most particularly those caused by the Pseudomonas genus. 6-[D-α-(3-guanyl-1-ureido)phenylacetamido] - penicillanic acid, a preferred embodiment of the invention, is prepared by the reaction of 6-(D-α-amino - phenylacetamido) - penicillanic acid (ampicillin) with a guanylcarbamylating agent.

3,579,502
PROCESS FOR PREPARING TETRAHYDRO[2,1-d]-BENZO[f][1,4] - DIAZEPIN - 6(7H)- ONES AND INTERMEDIATES
Marcel Müller, Frenkendorf, and Paul Zeller, Allschwil, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed Jan. 16, 1967, Ser. No. 609,321
Claims priority, application Switzerland, Jan. 21, 1966, 855/66
Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 **4 Claims**

In the instant case, there is disclosed various processes for preparing 5,9,10,14b-tetrahydroisoquino[2,1-d]-benzo[f][1,4]diazepin-6(7H)-ones(A). In one important process variation, a 1-(o-amino-phenyl)-3,4-dihydroisoquinoline(B) is reacted with a member capable of providing a halo-lower alkanoyl group such as halo lower alkanoyl halide to give a novel (2'-halo-lower alkanoyl-aminophenyl)(C) derivative. C is then ring closed to a novel 6-oxo - 6,7,9,10 tetrahydroisoquino[2,1-d]benzo[f][1,4]diazepin-(8)-ium(D). D is then reduced to A.

In another important process variation, B or a 1-(o-nitro-phenyl)-3,4-dihydroisoquinoline is treated with an α-substituted acetic acid derivative. The resulting product is reduced and ring closed at elevated temperatures to A.

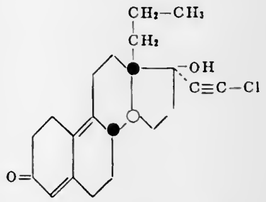
Compounds A are useful for pharmaceutical purposes, e.g. as sedatives, as tranquilizers, as anti-convulsants and as muscle relaxants.

3,579,503
PYRROLO[3,2,1-jk][1,4]BENZODIAZEPINONES
Jackson B. Hester, Jr., Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Filed Nov. 3, 1969, Ser. No. 873,718
Int. Cl. C07d *53/06*
U.S. Cl. 260—239.3 **21 Claims**

1,2 - dihydro - 7 - phenylpyrrolo[3,2,1-jk][1,4]benzodiazepin - 4(5H) - ones; 6,7 - dihydro - 7-phenylpyrrolo[3,2,1 - jk][1,4]benzodiazepin - 4(5H)-ones; 7-phenylpyrrolo[3,2,1 - jk][1,4]benzodiazepin-4(5H)-ones; 1,2 - dihydro - 6 - phenylpyrrolo[1,2,3-ef][1,5]benzodiazepin - 4(5H) - ones; 1,2 - dihydro-4-phenylpyrrolo[1,2,3-ef][1,5]benzodiazepin - 6(7H) - ones and 1,2,4,5-tetrahydro - 4 - phenylpyrrolo[1,2,3 - ef][1,5]benzodiazepin-6(7H)-ones, processes for preparing the same and novel intermediates prepared by said processes. The novel compounds of this invention exhibit tranquilizing and anticonvulsant activity in animals.

3,579,504
DERIVATIVE OF $\Delta^{4,9}$-GONADIENE AND PROCESS OF PREPARATION
Gerard Nominé, Noisy-le-Sec, Robert Bucourt, Clichy-sous-Bois, and André Pierdet, Noisy-le-Sec, France, assignors to Roussel-UCLAF, S.A., Paris, France
No Drawing. Continuation-in-part of application Ser. No. 282,587, May 23, 1963. This application Apr. 26, 1965, Ser. No. 451,051
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 **8 Claims**

The present invention relates to a new derivative of $\Delta^{4,9}$-gonadiene of Formula I;



(I)

as well as a process of preparation of the said compound. The invention also relates to intermediates useful in the production of the compound of Formula I.

3,579,505
ALISOL COMPOUNDS
Masuo Miyamoto, Kyoto, and Tadakazu Murata, Suita, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
No Drawing. Filed Sept. 25, 1968, Ser. No. 762,637
Int. Cl. C07c *169/38, 173/00*
U.S. Cl. 260—239.55 **17 Claims**

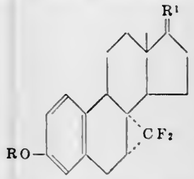
The crude extract of an Alismataceae plant or saponification product thereof is brought into contact with an acid (mineral acid, sulfonic acid, carboxylic acid, Lewis acid) whereby the Alisol B contained in the extract is converted into Alisol A. The Alisol compounds of the invention, including Alisol A itself, show hypercholesterolemic actviities.

3,579,506
α-AMINOISOTHIAZOLYLACETIC ACIDS AND THEIR PENICILLIN AND CEPHALOSPORIN DERIVATIVES
Raymond Urgel Lemieux and Rintje Raap, Edmonton, Alberta, Canada, assignors to R & L Molecular Research Ltd., Edmonton, Alberta, Canada
No Drawing. Filed Oct. 23, 1968, Ser. No. 770,068
Int. Cl. C07d *99/24, 99/16*
U.S. Cl. 260—239.1 **13 Claims**

α-aminoisothiazolylacetic acid derivatives of 6-amino- have been prepared and used in the preparation of α-aminoisothiazolylacetic acid derivatives of 6-aminopenicillanic acid and 7-aminocephalosporanic acid which have been found to be useful as antibacterial agents.

3,579,507
7α,8α-DIFLUOROMETHYLENE STEROIDS
David J. Marshall, Hampstead, Quebec, and Amedeo A. Failli, Montreal, Quebec, Canada, assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Filed July 28, 1969, Ser. No. 845,538
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.5 **10 Claims**

7α,8α-difluoromethylene steroids of the formula



in which R represents hydrogen, lower alkyl or cycloalkyl, or lower aliphatic acyl and R^1 represents O (ketonic oxygen) or the group

in which R^2 represents hydrogen, lower alkyl, lower alkynyl, lower dialkynyl, 2- or 3-furyl, or 2- or 3-thienyl groups.

3,579,508
21-SUBSTITUTED 6-CHLORO - 16α,17α-ISOPROPYLIDENEDIOXY-PREGNA - 4,6 - DIENE-3,20-DIONE AND METHOD OF PREPARING THE SAME
Milton David Heller, New City, N.Y., Robert Herman Lenhard, Paramus, N.J., and Seymour Bernstein, New City, N.Y., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Mar. 20, 1969, Ser. No. 808,983
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.55 **1 Claim**

The compounds 21-chloro or 21-methanesulfonyloxy-6-chloro-16α,17α-isopropylidendioxypregna-4,6 - diene - 3,20-dione are described along with methods of preparing the same. They are useful as anti-fertility agents.

3,579,509
PROCESS AND 6-β-SUBSTITUTED ETHYL INTERMEDIATES FOR PREPARING 6,6-ETHYLENE-3-KETO-Δ^4 STEROIDS
Kenneth G. Holden, Stratford, N.J., assignor to Smith Kline & French Laboratories, Philadelphia, Pa.
No Drawing. Continuation-in-part of abandoned application Ser. No. 465,788, June 21, 1965. This application Sept. 20, 1965, Ser. No. 488,758
Int. Cl. C07c *173/00*
U.S. Cl. 260—239.57 **17 Claims**

6,6 - ethylene steroids having potent, often enhanced, pharmacodynamic activity compared with their respective parent compounds are prepared by condensing a 3-lower alkoxy-3,5-diene steroid with β-acyloxyethylmercuric acylate, hydrolyzing the resulting 6-β-acyloxyethyl-3-lower alkoxy-3,5-diene steroid to give a 6-β-hydroxyethyl-3-lower alkoxy-3,5-diene steroid or a 6-β-hydroxyethyl-3-keto-Δ^4 steroid, esterifying same and cyclizing said ester.

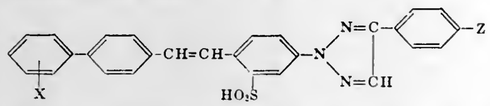
3,579,510
3-(HYDROXY-PHENYL) SUBSTITUTED AMIDINES AND DERIVATIVES THEREOF AS ANTHELMINTIC AGENTS
James W. McFarland, Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.
No Drawing. Filed Aug. 30, 1967, Ser. No. 664,258
Int. Cl. C07c *123/00;* **C07d** *49/34, 51/36*
U.S. Cl. 260—240 **4 Claims**

The preparation and anthelmintic properties of certain ω-(3-R-O-phenyl)substituted cyclic and acyclic amidines;

namely, 1,4,5,6-tetrahydro-2-[2-(3-R-O-phenyl)ethyl]pyrimidines, 1,4,5,6 - tetrahydro-2-[2-(3-R-O-phenyl)vinyl] pyrimidines and the corresponding 2-imidazolines; and N-methyl - N - substituted 3-(3-R-O-phenyl)propionamidines and the corresponding acrylamidines wherein R-O, is hydroxy or a group convertible to hydroxy, is described.

3,579,511
TRIAZOLE COMPOUNDS, PROCESSES FOR THEIR MANUFACTURE AND USE
Kurt Weber, Basel, Peter Liechti, Binningen, and Rudolf Meyer and Adolf Emil Siegrist, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland
No Drawing. Filed Aug. 6, 1968, Ser. No. 750,465
Claims priority, application Switzerland, Aug. 16, 1967, 11,487/67
Int. Cl. C07d *55/02*
U.S. Cl. 260—240 **2 Claims**

The invention comprises new triazole derivatives which are useful as optical brighteners—especially for detergents as well as cellulose and polyamide fibers—and which correspond to the formula



wherein Z represents hydrogen or a phenyl group and X signifies a sulphonic acid group or a hydrogen atom where Z represents a hydrogen atom, whilst if Z=phenyl the symbol X represents a sulphonic acid group, as well as their alkali or ammonium salts.

3,579,512
1-(4-PIPERIDYL)-BUTANONES
Hans Herbert Kühnis, Basel, and Ulrich Renner, Riehen, near Basel, Switzerland, assignors to Gelgy Chemical Corporation, Ardsley, N.Y.
No Drawing. Filed Dec. 30, 1968, Ser. No. 788,069
Claims priority, application Switzerland, Jan. 11, 1968, 423/68
Int. Cl. C07d *29/20*
U.S. Cl. 260—240 **5 Claims**

4-alkanoylpiperidine derivatives being further substituted in 4-position by allyl, propinyl or alkyl having from 2 to 4 carbon atoms and in 1-position by alkyl having at most 10 carbon atoms, cinnamyl or phenyl-loweralkyl, wherein the phenyl moiety is unsubstituted or substituted by halogen, loweralkyl or loweralkoxy, whereby the substituted or unsubstituted phenyl-loweralkyl contains at most 12 carbon atoms, and wherein the phenyl group is bound directly to the loweralkyl group or by way of various other moieties, such as hydroxymethylene, imino or alkenylimino, and the pharmaceutically acceptable acid addition salts thereof, have analgesic and antitussive activities; pharmaceutical compositions and methods of alleviating pain and producing an antitussive effect with these compounds are provided; an illustrative embodiment is 1-[1 - (3-phenylpropyl)-4-allyl-4-piperidyl]-butanone fumarate.

3,579,513
1-(1-SUBSTITUTED-4-ACETONYL-4-PIPERIDYL)-1-BUTANONES
Hans Herbert Kühnis, Basel, and Ulrich Renner, Riehen, near Basel, Switzerland, assignors to Gelgy Chemical Corporation, Ardsley, N.Y.
No Drawing. Filed Dec. 30, 1968, Ser. No. 788,070
Claims priority, application Switzerland, Jan. 11, 1968, 424/68
Int. Cl. C07d *29/20*
U.S. Cl. 260—240 **3 Claims**

4-acetonyl-4-alkanoyl-piperdine derivatives, substituted in 1-position by lower alkyl to which is attached either directly or by way of a vinylene, an oxygen, a carbonyl, a hydroxymethylene, an imino, an alkanoyloxymethylene, an alkylimino, an alkenylimino or an alkanoylimino group, a substituted or unsubstituted phenyl moiety, have analgesic and antitussive properties; pharmaceutical compositions comprising these compounds and methods for alleviating pain and producing an antitussive effect are providel; an illustrative embodiment is 1-[1-(3-phenylpropyl)-4-acetonyl-4-piperidyl]-1-butanone.

3,579,514
7 - [α-(3 - GUANYL-1-UREIDO)ARYL-ACETAMIDO] CEPHALOSPORANIC ACIDS AND DERIVATIVES THEREOF
Donald Neil McGregor, Fayetteville, N.Y., assignor to Bristol-Myers Company, New York, N.Y.
No Drawing. Filed Jan. 24, 1969, Ser. No. 793,909
The portion of the term of the patent subsequent to May 18, 1988, has been disclaimed
Int. Cl. C07d *99/24*
U.S. Cl. 260—243C **27 Claims**

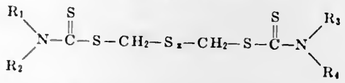
7-[α-(3-guanyl-1-ureido)phenylacetamido]- and 7-[α-(3 - guanyl - 1 - ureido)thienylacetamido]cephalosporanic acids and the corresponding betaines and desacetoxy derivatives are valuable as antibacterial agents, as nutritional supplements in animal feeds and as therapeutic agents in poultry and animals, including man, and are especially useful in the treatment of infectious diseases caused by Gram-positive and Gram-negative bacteria, most particularly those caused by the Pseudomonas genus. 7 - [D - α - (3-guanyl-1-ureido)phenylacetamido]cephalosporanic acid, a preferred embodiment of the invention, is prepared by the treatment of 7-(D-α-amino-phenylacetamido)cephalosporanic acid with a guanylcarbamoylating agent.

3,579,515
MOLECULAR COMPLEXES OF CYCLIC CARBAMATE POLYMERS WITH PHENOLS AND THIOPHENOLS
Wilhelm E. Walles, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Continuation-in-part of application Ser. No. 573,488, Aug. 19, 1966, which is a continuation-in-part of application Ser. No. 12,254, Mar. 2, 1960. This application Feb. 4, 1969, Ser. No. 796,592
Int. Cl. C08f *7/12*
U.S. Cl. 260—244 **1 Claim**

Stable complexes of phenols or thiophenols with cyclic carbamate polymers such as poly(vinyl oxazolidinone).

3,579,516
BIS(THIOCARBAMYLTHIOMETHYL) POLYSULFIDES
Harry Elmer Albert, deceased, late of Lafayette Hill, Pa., by Dorothy S. Albert, executrix, Lafayette Hill, Pa., assignor to Pennwalt Corporation
No Drawing. Filed Nov. 29, 1968, Ser. No. 781,691
Int. Cl. C07d *87/46*
U.S. Cl. 260—246 **10 Claims**

Novel compounds having the structure



where R_1 and R_3 are alkyl or aryl, R_2 and R_4 are alkyl with the understanding that R_1 and R_2 and R_3 and R_4 may form a ring, and where x is an integer of from 2 to 6. These new compositions are useful as accelerators for the sulfur vulcanization of unsaturated elastomers and may be used as vulcanizing agents.

3,579,517
SECONDARYAMINO PYRIDAZINES
William J. Houlihan and Robert E. Manning, Mountain Lakes, N.J., assignors to Sandoz-Wander, Inc., Hanover, N.J.
No Drawing. Continuation-in-part of application Ser. No. 849,151, Aug. 11, 1969, which is a continuation-in-part of application Ser. No. 671,962, Oct. 2, 1967. This application Sept. 22, 1969, Ser. No. 860,059
Int. Cl. C07d *51/04*
U.S. Cl. 260—250 **16 Claims**

Secondaryamino pyridazines and hydrazine substituted secondaryamino pyridazines, e.g., 3,6-dichloro-4-diallylaminopyridazine and 3 - chloro - 4 - dimethylamino-6-hydrazinopyridazine, are prepared from 3,4,6-trihalopyridazines and are useful as central nervous system stimulants and as anti-hypertensives.

3,579,518
ANTHRAPYRIMIDINE-SUBSTITUTED ANTHRAQUINONE AMIDES
Eduard Moergeli, Muttenz, Switzerland, assignor to Ciba Limited, Basel, Switzerland
No Drawing. Filed Feb. 20, 1968, Ser. No. 706,784
Claims priority, application Switzerland, Mar. 8, 1967, 3,394/67
Int. Cl. C07d *51/46*
U.S. Cl. 260—256.4 **7 Claims**

Anthraquinone compounds of the formula

A—CONH—B

in which A represents a 1,9 anthrapyrimidine radical bound to the —CONH-group in 2-position and B represents an anthraquinone residue bound to the NH-group in 1-position, the said anthraquinone radical containing an aroylamino group in 4-position, are valuable vat dyestuffs which dye cellulose-fibers orange shades of excellent fastness properties. These compounds are also valuable pigments which color plastic masses orange shades of outstanding fastness to light and migration.

3,579,519
CRYSTALLINE FORM OF QUINACRIDONE
Hans R. Schweizer, Herrliberg, Switzerland, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Sept. 8, 1966, Ser. No. 577,932
Int. Cl. C07d *37/18*
U.S. Cl. 260—279 **5 Claims**

An improved quinacridone having good light fastness, a more-reddish shade with high tinctorial power and a soft texture is prepared by a process which comprises dissolving quinacridone prepared by known methods in hot hexamethyl phosphoramide at a temperature above 100° C. The solution is then poured into a cold non-solvent such as methanol. The precipitated quinacridone is subsequently separated from the mixture. Quinacridone prepared by the described procedure is useful as a pigment for coloring dopes and melts in the manufacture of molded objects, fibers, films, etc.

3,579,520
4-(4-PIPERIDINYL-METHYL OR -1-ETHYL) AMINO-7-CHLOROQUINOLINES
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 596,401, Oct. 23, 1966, now Patent No. 3,505,339, dated Apr. 7, 1970. This application Aug. 21, 1969, Ser. No. 852.067
Int. Cl. C07d *33/52*
U.S. Cl. 260—288 **5 Claims**

4-(4-piperidinyl-methyl or -1-ethyl)amino - 7 - chloroquinolines where 4-piperidinyl is substituted at its 1-position by ethyl or 2-hydroxyethyl, having chemotherapeutic and pharmacological properties, are prepared by reacting 4,7-dichloroquinoline with the corresponding 1-substituted-4-piperidinyl-methyl or -1-ethylamines, the latter novel amines being prepared by various generally known reduction procedures.

3,579,521
PRODUCTION OF VINYL SUBSTITUTED AROMATICS FROM METHYL SUBSTITUTED AROMATICS
Raymond A. Franz, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Jan. 15, 1969, Ser. No. 791,482
Int. Cl. C07c *3/00, 15/24;* **C07d** *31/20*
U.S. Cl. 260—290 **9 Claims**

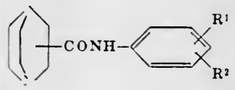
Vinyl substituted aromatic compounds are produced in a non-catalytic process by contacting a methyl substituted aromatic compound with an oxygen containing organic compound selected from the group consisting of acetic acid, dimethyl ether, di-t-butyl peroxide and diketene. The contacting is carried out at a temperature of from about 700 to about 950° C. at a pressure of not more than four atmospheres absolute.

3,579,522
PROCESS FOR THE PRODUCTION OF POLYESTER VARNISH SOLUTIONS
Otto Bendszus and Clemens Niehaus, Krefeld, and Manfred Patheiger, Krefeld-Uerdingen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Jan. 21, 1969, Ser. No. 792,849
Claims priority, application Germany, Feb. 5, 1968, P 16 44 816.1
Int. Cl. C08g *51/22*

A varnish solution comprising a polyester of an α,β-unsaturated dicarboxylic acid dissolved in a copolymerizable ethylenically unsaturated monomer, said solution having a thixotropy ΔF of at least about 10% and containing a liquid organopolysiloxane.

3,579,523
ANILIDES OF QUINUCLIDINE-2- AND QUINUCLIDINE-3-CARBOXYLIC ACID
Rune Verner Sandberg, Jarna, and Berndt Olof Harald Sjoberg, Sodertalje, Sweden, and Claes Philip Tegner, deceased, late of Sodertalje, Sweden, by Gunnel Margareta Tegner, executrix, Sodertalje, Sweden, assignors to Aktiebolaget Astra, Sodertalje, Sweden
No Drawing. Filed May 17, 1968, Ser. No. 729,947
Claims priority, application Sweden, May 23, 1967, 7,251
Int. Cl. C07d *36/09*
U.S. Cl. 260—293.4 **7 Claims**

A process for preparing anilides of quinuclidine-2- and quinuclidine-3-carboxylic acid, their therapeutically acceptable salts, and pharmaceutical preparations is disclosed, as well as anilide compounds of the formula:



(I)

wherein R_1 and R_2 may be the same or different and represent hydrogen, halogen, or alkyl having at most three carbon atoms. Antiarrhythmic and local anesthetic effects of the disclosed compounds are shown.

3,579,524
2-AMINOALKYL DERIVATIVES OF PHTHALIMIDINES

John William Van Dyke, Jr., Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

No Drawing. Filed June 5, 1968, Ser. No. 734,574
Int. Cl. C07d *29/30*
U.S. Cl. 260—294 **6 Claims**

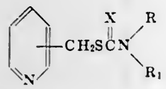
2-aminoalkyl derivatives of phthalimidine that are useful as antihypertensive agents. Prepared by reacting phthalic anhydride with a suitable amine and selectively reducing one of the oxo groups of the resulting phthalimide to form the desired compound.

3,579,525
S-(PYRIDYL)METHYL THIO- AND DITHIO-CARBAMATES

Harry Tilles, El Cerrito, and Mervin E. Brokke, Moraga, Calif., assignors to Stauffer Chemical Company, New York, N.Y.

No Drawing. Filed Oct. 7, 1968, Ser. No. 765,681
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 **32 Claims**

S-(pyridyl)methyl thio- and dithio-carbamates having the formula



in which X is oxygen or sulfur, R and R_1 are independently alkyl, alkenyl, or cyclohexyl and R and R_1 taken together are alkylene and dialkyl substituted alkylene, provided that when X is sulfur and R and R_1 are both alkyl, at least one of the alkyl groups contains 3 or more carbon atoms. The above compounds, as well as those excluded by the proviso, are effective herbicides. Representative compounds are

S-(3-pyridyl)methyl di-n-propylthiocarbamate,
S-(2-pyridyl)methyl di-n-butylthiocarbamate,
S-(4-pyridyl)methyl methylcyclohexylthiocarbamate,
S-(4-pyridyl)methyl ethyl-n-butylthiocarbamate and S-(3-pyridyl)methyl 1-(5-ethyl-2-methyl-piperidinecarbothioate).

3,579,526
PREPARATION OF THIENOPYRIDINES

Le Roy H. Klemm and Joseph Shabtai, Eugene, Oreg., and David R. McCoy, Wappingers Falls, N.Y., assignors to Research Corporation, New York, N.Y.

No Drawing. Filed Nov. 13, 1968, Ser. No. 775,534
Int. Cl. C07d *31/50*
U.S. Cl. 260—294.8 **13 Claims**

Thienopyridines are prepared by the decomposition of benzyl 2-(pyridyl) ethyl sulfides. The thermal decomposition may be catalytic or non-catalytic and is desirably carried out at a temperature in the range 500–700° C. Thieno[3,2-b] pyridine is prepared by the thermal decomposition of benzyl 2-(2-pyridyl) ethyl sulfide and thieno[2,3-c] pyridine is prepared by the thermal decomposition of benzyl 2-(4-pyridyl) ethyl sulfide.

3,579,527
N-SUBSTITUTED PYRIDO-INDOLE DERIVATIVES

Meier E. Freed, Philadelphia, Pa., assignor to American Home Products Corporation, New York, N.Y.

No Drawing. Original application June 27, 1966, Ser. No. 560,811. Divided and this application July 18, 1969, Ser. No. 870,805
Int. Cl. C07d *39/00*
U.S. Cl. 260—296 **2 Claims**

N-substituted-tetrahydropyrido-indoles are prepared having useful pharmacological activity, particularly on the central nervous system.

3,579,528
2,6-DIHYDROXYTRICHLOROPYRIDINE AND ITS PREPARATION

Robert Neville Haszeldine, "Windyridge," Lyme Road, Disley, Cheshire, England, and William Thain Flowers, 19 Birch Grove, Rusholme, Manchester 14, England

No Drawing. Filed May 22, 1968, Ser. No. 731,273
Claims priority, application Great Britain, June 7, 1967, 26,218/67
Int. Cl. C07d *31/28*
U.S. Cl. 260—297 **4 Claims**

The new compound 2,6-dihydroxytrichloropyridine is prepared by reacting 2,6-diaminopyridine with chlorine while in admixture with aqueous mineral acid. The dihydroxytrichloropyridine is useful as a contact herbicide and as a novel intermediate in the preparation of pentachloropyridine.

3,579,529
HETEROCYCLIC COMPOUNDS

Kevan Brown, Woodley, and John F. Cavalla, Isleworth, England, assignors to John Wyeth & Brother Limited, Taplow Maidenhead, England

No Drawing. Filed Oct. 15, 1968, Ser. No. 767,853
Claims priority, application Great Britain, Oct. 26, 1967, 48,641/67
Int. Cl. C07d *91/32, 85/44*
U.S. Cl. 260—302 **11 Claims**

A group of oxazoles and thiazoles substituted by a cycloaliphatic radical in the 2-position and an aliphatic acidic radical in the 4-position is described. The compounds are useful as anti-inflammatory agents.

3,579,530
PROCESS FOR THE RESOLUTION OF RACEMIC TETRAMISOLE

Robert Alfred Dewar, Ashburton, Victoria, Volker Elmar Maier, Hampton, Victoria, and Margaret Anthea Ingram, South Yarra, Victoria, Australia, assignors to Imperial Chemical Industries of Australia and New Zealand Limited

No Drawing. Filed Aug. 12, 1968, Ser. No. 751,716
Claims priority, application Australia, Aug. 24, 1967, 26,376; Jan. 11, 1968, 32,285; Jan. 18, 1968, 32,424
Int. Cl. C07d *99/06*
U.S. Cl. 260—306.7 **7 Claims**

Resolution of tetramisole into its optically active D- and L-isomers using a resolving acid in a predominantly aqueous medium whereby said acid forms a salt with one of the isomers and said salt crystallises from the medium to the substantial exclusion of the other tetramisole isomer salt.

3,579,531
PROCESS FOR PREPARING 1-PHENYL-1,2,3-TRIAZOLES

Peter Scheiner, Princeton, N.J., assignor to Mobil Oil Corporation

No Drawing. Filed Feb. 28, 1968, Ser. No. 708,753
Int. Cl. C07d *55/02*
U.S. Cl. 260—308 **6 Claims**

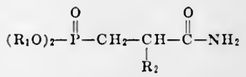
Phenyl triazole and various substituted phenyl triazoles are prepared by reacting substituted phenyl azides or phenyl azide with a vinyl ester of a lower alkanoic acid preferably vinyl acetate, at reflux temperature and at atmospheric pressure. 1-phenyl-1,2,3-triazole and substituted derivatives thereof are stabilizers for polyolefins. The 1-halophenyl-1,2,3-triazoles are effective fungicides and miticides.

3,579,532
BIS-PHOSPHONO-PROPIONAMIDE SUBSTITUTED ETHYLENE GLYCOLS AND IMIDAZOLIDINONES

Hermann Nachbur, Dornach, Switzerland, Bernard Peter Stark, Stapleford, Cambridge, England, and Arthur Maeder, Therwil, Switzerland, assignors to Ciba Limited, Basel, Switzerland

No Drawing. Filed July 22, 1968, Ser. No. 746,308
Claims priority, application Great Britain, July 28, 1967, 34,922/67
Int. Cl. C07d *49/34*
U.S. Cl. 260—309.7 **10 Claims**

This invention provides phosphorus-containing products which are obtained by reacting a compound of the formula



wherein R_1 represents a substituent bound through a carbon atom to the oxygen atom and R_2 e.g. a hydrogen atom or a methyl group, with glyoxal, formaldehyde, urea and an etherifying agent like a saturated or unsaturated aliphatic alcohol.

These phosphorus-containing reaction products are useful as agents for flameproofing.

3,579,533
PREPARATION OF PORPHIN, SUBSTITUTED PORPHIN AND METAL CHELATES THEREOF

Richard G. Yalman, Yellow Springs, Ohio, assignor to Antioch College, Yellow Springs, Ohio

No Drawing. Filed Mar. 18, 1968, Ser. No. 714,064
Int. Cl. C07d *27/76*
U.S. Cl. 260—314 **10 Claims**

Preparation of porphin, meso monomethyl-, meso dimethyl-, meso trimethyl-, and meso tetramethylporphin, and the metal chelates thereof in relatively large quantities with yields in the range of 1% to 20% is accomplished by cyclic condensation of a pyrrole having a primary or secondary carbinol in the 2 position thereof to form a metal chelate followed by demetallation to form porphin or the meso substituted porphin. The reaction mixture includes the hydroxypyrrole, a metal acetate, an organic acid and a polar solvent, and by (1) controlling the pH of the buffer formed by the metal acetate and the acid to between 3.2 and 5.5 based on a water system, (2) controlling the temperature of the reaction mixture in the range of 120° C. to 150° C., and (3) reducing the self-polymerization of the hydroxy-pyrrole by dropwise addition of a precooled mixture thereof to a preheated solvent system, much improved yields of the metal chelates are obtained. Also, the yields of porphin and meso substituted porphins were increased by an improved demetallation procedure permitting 75% to 85% yields from the corresponding metal chelates. Various metal acetates, solvents, temperature ranges, ratios of reactants and reaction conditions and techniques are described.

3,579,534
TETRAHYDROCARBAZOLECARBOXYLATES

Ruddy Littell, Rivervale, and George Rodger Allen, Jr., Old Tappan, N.J., assignors to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed May 9, 1969, Ser. No. 823,471
Int. Cl. C07d *27/68*
U.S. Cl. 260—315 **6 Claims**

Preparation of substituted tetrahydrocarbazolecarboxylic derivatives, are described. They are useful for their central nervous system activity, as anticonvulsants.

3,579,535
SUBSTITUTED PHENYLACETIC ACIDS AND ESTERS THEREOF

Rolf Denss, 43 Schutzenmattstr., Basel, Switzerland; Niels Clauson-Kaas, 28 Rugmarken, Farum, Denmark; and Franz Ostermayer, 5 Am Hang, Riehen, Switzerland

No Drawing. Filed Oct. 30, 1967, Ser. No. 679,224
Claims priority, application Switzerland, Oct. 31, 1966, 15,768; Jan. 31, 1967, 713; Aug. 7, 1967, 11,178
Int. Cl. C07d *27/26*
U.S. Cl. 260—326.3 **24 Claims**

Substituted phenyl acetic acids, addition salts thereof with bases as well as esters thereof, which compounds exhibit useful antiinflammatory (antiphlogistic), analgesic and antipyretic activity, and processes for the production of these compounds, as well as starting materials used in said processes; therapeutic compositions containing these compounds, and methods of treatment, particularly methods of inducing antiinflammatory, analgesic and antipyretic effects in mammals. Illustrative embodiments are 2-[p-(1-pyrryl)-phenyl]-butyric acid, [3-chloro-4-(1-pyrryl)-phenyl]-acetic acid and 2-[p-(1-pyrryl)-phenyl]-propionic acid methyl ester.

3,579,536
ADDITION PRODUCTS OF METHYLFORMAMIDE OR SUCCINIMIDE WITH GLYOXAL

Sidney L. Vail and Andrew G. Pierce, Jr., New Orleans, La., Clifford M. Moran, San Gabriel, Calif., and Robert H. Barker, Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Feb. 23, 1966, Ser. No. 529,251
Int. Cl. C07d *27/10*
U.S. Cl. 260—326.3 **3 Claims**

The invention provides the compounds N,N′-dihydroxyethylenebis(methylformamide), N,N′-dihydroxyethylenebissuccinimide, and N,N′-(1,2-diacetoxyethylene)bissuccinimide which are useful as textile finishing agents for cellulosic fabrics, in resin applications, and in pharmaceutical and allied industries.

3,579,537
PROCESS FOR SEPARATION OF SULTONES FROM ALKENYL SULFONIC ACIDS

Joseph Rubinfeld and Henry Leon Levinsky, Brooklyn, N.Y., assignors to Colgate-Palmolive Company, New York, N.Y.

No Drawing. Filed Aug. 15, 1966, Ser. No. 581,409
Int. Cl. C07c *143/16;* **C07d** *89/06*
U.S. Cl. 260—327 **13 Claims**

The instant process is directed to separation of a sultone and an alkenyl sulfonic acid from a mixture thereof prepared by sulfonation of an olefin with SO_3, which comprises adding to said mixture (a) a water-soluble lower ketone which is a solvent for said sultone and said acid, and (b) a base which forms with said sulfonic acid a water soluble sodium, potassium, lithium or ammonium salt insoluble in said solvent, whereby to form a precipitate of said salt and a solution of said sultone, the temperature at the time of formation of said precipitate being at least about 15° C.

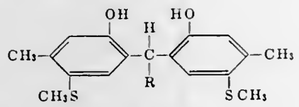
3,579,538

SUBSTITUTED BIS(2-HYDROXY-4-METHYL-5-METHYLTHIOPHENYL) METHANES

Ronald J. Meyer, Orville E. Horsley, and Herman J. Eichel, Cincinnati, Ohio, assignors to American Hoechst Corporation, New York, N.Y.

No Drawing. Filed June 26, 1968, Ser. No. 740,054
Int. Cl. C07c *15/12;* **C07d** *63/12, 63/22*
U.S. Cl. 260—330.5 **1 Claim**

Substituted bis(2 - hydroxy - 4 - methyl - 5 - methylthiophenyl)methane compounds having laxative (cathartic) properties of the general formula:



and a process for preparing them.

3,579,539

DUAL SOLVENT SEPARATION OF 4-HYDROXYBENZOTHIOPHENE FROM 4-OXO-4,5,6,7-TETRAHYDROBENZOTHIOPHENE

Edward M. Bullard, Fords, N.J., assignor to Mobil Oil Corporation

Filed Jan. 16, 1969, Ser. No. 791,614
Int. Cl. C07d *63/18, 63/22*
U.S. Cl. 260—330.5 **2 Claims**

4-hydroxybenzothiophene is separated from 4-oxo-4,5,6,7-tetrahydrobenzothiophene by liquid-liquid extraction using a dual solvent system of a polar solvent, preferably propylene glycol, and a non-polar solvent, preferably toluene. The 4-hydroxybenzothiophene can be converted into N-methyl-4-benzothienyl carbamate, an effective pesticide (see U.S. 3,288,673 and 3,288,808).

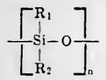
3,579,540

METHOD FOR PROTECTING NONPOROUS SUBSTRATES AND FOR RENDERING THEM WATER REPELLENT

Howard G. Ohlhausen, 82 Graymoor Lane, Olympia Fields, Ill. 60461

No Drawing. Filed Nov. 1, 1968, Ser. No. 772,856
Int. Cl. C08g *31/02, 51/34*
U.S. Cl. 260—33.4 **16 Claims**

Method and composition for treating nonporous substrates to protect and render same water repellent. A mineral acid is added to a solvent and an alkyl polysiloxane is then added to that mixture to produce the composition. The alkyl polysiloxane has the formula:



wherein n is an integer greater than 1, R_1 is a lower alkyl containing 1–7 carbon atoms and R_2 is hydrogen, a lower alkyl containing 1–7 carbon atoms or an aryl radical containing about 6 carbon atoms.

3,579,541

CYCLIC DIPEROXIDES

Yun G. Chang, Austin, Tex., assignor to Reichhold Chemicals, Inc., White Plains, N.Y.

No Drawing. Filed June 4, 1968, Ser. No. 734,258
Int. Cl. C07d *19/00*
U.S. Cl. 260—338 **9 Claims**

Cyclic peroxides are prepared by reacting hydroxy acetone with a difunctional hydroperoxide. The reaction takes place in a solvent at a temperature ranging from about 0° C. to 100° C. in presence of an acidic catalyst. The resulting cyclic peroxides are found to be highly efficient polymerization initiators and cross-linking agents.

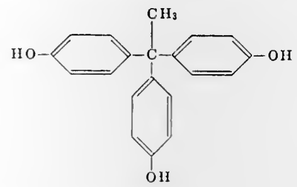
3,579,542

4,4′,4″-TRIHYDROXYTRIPHENYLMETHYLMETHANE

Ronald J. Meyer, Orville E. Horsley, and Herman J. Eichel, Cincinnati, Ohio, assignors to American Hoechst Corporation, New York, N.Y.

No Drawing. Filed June 26, 1968, Ser. No. 740,066
Int. Cl. C09b *11/08*
U.S. Cl. 260—395 **1 Claim**

4,4′,4″-trihydroxytriphenylmethylmethane having laxative (cathartic) properties of the formula:



and a process for preparing it.

3,579,543

$\Delta^{1,3,5(10)}$-2- (OR 4-)FORMYL-3-HYDROXYOESTRATRIENE COMPOUNDS

Max Salomon de Winter and Jan Evert Ribbers, Oss Netherlands, assignors to Organon Inc., West Orange, N.J.

No Drawing. Filed May 13, 1966, Ser. No. 549,786
Claims priority, application Netherlands, May 22, 1965, 6506542; Jan. 15, 1966, 6600548
Int. Cl. C07c *167/14*
U.S. Cl. 260—397.4 **2 Claims**

$\Delta^{1,3,5(10)}$-3-hydroxy-oestratriene compounds substituted in position 2 or 4 by a formyl group, and the 3-ethers or 3-esters thereof, are prepared by reacting the 3-hydroxyoestratriene compound with chloroform in the presence of a metal hydroxide, followed by etherification or esterification of the 3-hydroxy group. The resulting products are biologically active in decreasing the serum concentration of cholesterol and the cholesterol/phospholipid ratio, and exhibit weak estrogenic activity and osteotrophic activity.

3,579,544

TOTAL PROCESS FOR MAKING 13-HYDROCARBON SUBSTITUTED GONAPOLYENE - 17 - ONE COMPOUNDS AND INTERMEDIATES PRODUCED IN THE COURSE OF THE PROCESS

Kentaro Hiraga, Ikeda, Tsunehiko Asako, Sulta, and Takuichi Miki, Amagasaki, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

No Drawing. Filed May 24, 1968, Ser. No. 731,968
Claims priority, application Japan, May 24, 1967, 42/32,973; May 25, 1967, 42/33,238
Int. Cl. C07c *169/08*
U.S. Cl. 260—397.5 **9 Claims**

A compound having a 16-(etherified or esterified hydroxy)-17-acyloxy-13 - substituted gona-1,3,5(10),8,14-pentaene nucleus is obtained by allowing a compound having a 17-acyloxy-13-substituted 8,14-secogona-1,3,5(10),9(11),15-pentaene-14-one nucleus to contact with an acid catalyst in presence of alcohol, phenol or fatty acid, and converting the resultant compound having a 16-(etherified or esterified hydroxy)-17-acyloxy-13-substituted gona-1,3,5(10),8,14-pentaene nucleus, directly or after reduction of its double bond at the 8-position or bands at the 8- and 14-positions, to a compound having a 13-(hydrocarbon substituted)gonapolyen-17-one nucleus. It is thus made possible to effect the total synthesis of the gona polyenes (e.g. estrone) via a lesser number of steps than has heretofore been possible.

3,579,545

NOVEL 11β-ALKOXY GONA-1,3,5(10)-TRIENES

Daniel Bertin, Montrouge, and Andre Pierdet, Noisy-le-Sec, France, assignors to Roussel-UCLAF, Paris, France

No Drawing. Continuation-in-part of application Ser. No. 643,062, June 2, 1967. This application Aug. 25, 1969, Ser. No. 852,905
Claims priority, application France, Sept. 7, 1966, 75,528; Dec. 9, 1966, 86,879; Feb. 28, 1967, 96,848; Mar. 9, 1967, 98,154
Int. Cl. C07c *169/08*
U.S. Cl. 260—397.5 **20 Claims**

Novel 11β-lower alkoxy-$\Delta^{1,3,5(10)}$-gonatrienes substituted in the 3-position by a member selected from the group consisting of hydroxy, alkoxy of 1 to 4 carbon atoms, cycloalkoxy of 5 to 6 carbon atoms, and acyloxy, wherein the acyl is derived from an organic carboxylic acid having 1 to 18 carbon atoms, in the 13-position by a lower alkyl radical, and in the 17-position by the grouping

wherein X is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms, and Y is selected from the group consisting of a hydrocarbon radical and a substituted hydrocarbon radical. These compounds possess estrogenic activity.

3,579,546

ORGANIC SULFONATE PRODUCTION BY BUFFERED ADDITION OF BISULFITE TO UNSATURATED HYDROCARBONS

Charles J. Norton, Berkeley, Calif., assignor to Marathon Oil Company, Findlay, Ohio

No Drawing. Filed Sept. 30, 1968, Ser. No. 763,929
Int. Cl. C07c *143/90*
U.S. Cl. 260—400 **10 Claims**

This invention details a process for the manufacture of organic sulfonates from unsaturated hydrocarbons containing 6 to about 30 carbon atoms per molecule including reacting the unsaturated hydrocarbons and bisulfite in a cosolvent system comprising water and an organic hydroxyl-containing compound at from 0 to about 300° C. in the presence of a free radical initiator. Also, a sufficient quantity of a buffer compound is present to maintain the pH from about 5 to about 9, where the buffer is a partially neutralized non-bisulfite poly-basic weak acid. The buffer is left in the reaction mixture as a builder for the final alkane sulfonate highly biodegradable low foam detergent formulation.

3,579,547

CARBOXYLIC ACID ESTERS

James T. Traxler, Evanston, Ill., assignor to SCM Corporation, New York, N.Y.

No Drawing. Filed Dec. 16, 1966, Ser. No. 602,166
Int. Cl. C11c *3/04*
U.S. Cl. 260—410.6 **15 Claims**

Novel internal carboxylic acid esters of linear aliphatic polyatomic alcohols have been prepared. The polyatomic alcohols comprising the alcohol portion of the esters contain from 4 to 12 carbon atoms and the carboxylic acid portion of the esters contain from 2 to 26 carbon atoms. Preferred esters are carboxylic acid esters of mannitol and sorbitol and are useful as emulsifying agents. Particularly preferred esters are the mono- and di-stearoyl and palmitoyl esters of sorbitol and mannitol. The novel esters are prepared by reacting a carboxylic acid or a lower alkyl ester of a carboxylic acid with an ketalized linear aliphatic polyatomic alcohol in the presence of an alkaline catalyst to form a carboxylic acid ester of the ketalized alcohol and thereafter hydrolyzing the ketal of the ester to form hydroxyl groups at the terminal carbon atom. The hydrolysis is preferably accomplished by acid.

3,579,548

TRIGLYCERIDE ESTERS OF α-BRANCHED CARBOXYLIC ACIDS

David D. Whyte, Wyoming, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed May 10, 1968, Ser. No. 728,362
Int. Cl. C11c *3/02;* **A23d** *3/00*
U.S. Cl. 260—410.7 **1 Claim**

Glycerol esters of α-branched carboxylic acids have the physical properties and utility, e.g., in food compositions, of ordinary triglyceride fat but are less digested or absorbed and are thus low calorie.

3,579,549

ACYL DERIVATIVES OF THE CONDENSATION POLYMERS OF ALPHA-HYDROXY-PROPIONIC ACID WITH BETA-HYDROXYBUTYRIC ACID AND/OR BETA-HYDROXYPROPIONIC ACID

Hans H. Stockmann, Plainfield, Dilip K. Ray-Chaudhuri, Somerset, and Richard M. Boettger, Morristown, N.J., assignors to National Starch and Chemical Corporation, New York, N.Y.

No Drawing. Filed Sept. 29, 1967, Ser. No. 671,566
Int. Cl. A21d *2/16;* **C11c** *3/04*
U.S. Cl. 260—410.9R **14 Claims**

Acyl derivatives of the condensation polymers of alpha-hydroxypropionic acid with beta-hydroxybutyric acid and/or beta-hydroxypropionic acid, as well as the alkali metal, alkaline-earth metal and ammonium salts thereof; the latter derivatives serving as food emulsifiers and as shortening aids. A process for preparing baked goods as well as the baked goods resulting therefrom, said process comprising the incorporation of the above specified derivatives into the raw dough mix prior to the baking thereof. The resulting baked goods are characterized by their prolonged retention of freshness, fine texture, good color and substantial volume.

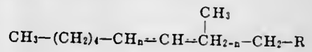
3,579,550

OXYGENATED DERIVATIVES OF ACYCLIC OLEFINS

Edouard P. Demole, Geneva, Switzerland, assignor to Firmenich & Cie, Geneva, Switzerland

No Drawing. Filed Jan. 16, 1969, Ser. No. 791,770
Claims priority, application Switzerland, Jan. 17, 1968, 792/68
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 **7 Claims**

Compounds having the formula



wherein a double bond is located in one of the positions indicated by the dotted lines and wherein R represents a —COOH or —CH_2OH group and n stands for the integer 1 or 2; and methods for manufactuing the said compounds which are useful as fragrances and fixatives in the perfume industry.

3,579,551

PRODUCTION OF CARBOXYLIC ACIDS

John H. Craddock, Ballwin, and Arnold Hershman, Creve Coeur, Mo., Frank E. Paulik, Houston, Tex., and James F. Roth, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Aug. 15, 1968, Ser. No. 752,795
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 **27 Claims**

The present invention relates to a process for the preparation of carboxylic acids, specifically by the reaction

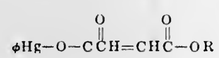
of ethylenically unsaturated compounds with carbon monoxide and water, in the presence of catalyst compositions essentially comprising iridium compounds and complexes, together with an iodide promoter.

3,579,552
PRODUCTION OF CARBOXYLIC ACIDS
John H. Craddock, Ballwin, and Arnold Hershman, Creve Coeur, Mo., Frank E. Paulik, Houston, Tex., and James F. Roth, Creve Coeur, Mo., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Aug. 15, 1968, Ser. No. 752,746
Int. Cl. C08h *17/36*
U.S. Cl. 260—413 **25 Claims**

The present invention relates to a process for the preparation of carboxylic acids, specifically by the reaction of ethylenically unsaturated compounds with carbon monoxide and water, in the presence of catalyst compositions essentially comprising rhodium compounds and complexes, together with an iodide promoter.

3,579,553
PHENYLMERCURY COMPOUNDS
John R. Leebrick, Old Lyme, Conn., assignor to Cosan Chemical Corporation, Clifton, N.J.
No Drawing. Filed Aug. 21, 1968, Ser. No. 754,490
Int. Cl. C07f *3/12*
U.S. Cl. 260—434 **5 Claims**

Novel compounds are provided of the formula



wherein R is an aliphatic or cyclic alkyl radical, aralkyl radical or aliphatic alkenyl radical. These compounds are useful as catalysts for making polyurethanes, and also act antimicrobially in the polyurethanes, and as antimicrobial agents for coating compositions, including common and marine paints and coatings, and for turf and seeds and as marine antifouling agents and as preservatives. The term "antimicrobial" as employed herein includes "cidal" and static control of bacteria, yeasts, fungi and the like.

3,579,554
DESLUDGING TEL WITH OXYGENATED WATER
Jean Claude Boudreau, Landenburg, Pa., assignor to E. I. du Pont de Nemours and Company
Filed Oct. 31, 1968, Ser. No. 772,339
Int. Cl. C07f *7/26*
U.S. Cl. 260—437 **9 Claims**

A process for purifying impure tetraethyllead by mixing said impure tetraethyllead with water containing dissolved oxygen thereby converting the impurities into a sludge phase.

3,579,555
CHROME COMPLEXES OF SUBSTITUTED BENZOIC ACID
William J. Pangonis, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Feb. 3, 1969, Ser. No. 796,224
Int. Cl. C07f *11/00;* **C23c** *3/00*
U.S. Cl. 260—438.5 **3 Claims**

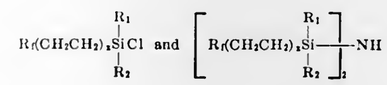
This invention relates to novel chrome complexes of benzoic acid. These complexes are exemplified by p-sulfamylbenzoic acid chrome complex and p-acetamidobenzoic acid chrome complex.

3,579,556
NICKEL KETOXIME CHELATES
Peter James Briggs and Ronald James Hurlock, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed June 21, 1968, Ser. No. 738,839
Claims priority, application Great Britain, June 26, 1967, 29,427/67
Int. Cl. C07j *15/04;* **C08j** *45/62*
U.S. Cl. 260—439R **4 Claims**

Nickel chelate complexes of syn-alkyl 2-hydroxyaryl ketoximes in which the alkyl group contains at least 6 carbon atoms are used as light stabilisers for polymers, especially polyolefins. The chelate complexes are prepared from the syn-alkyl 2-hydroxyaryl ketoximes by reacting with a solution of a nickel salt.

3,579,557
WATER AND OIL REPELLENTS
Thomas W. Brooks and Paul D. Schuman, Gainesville, and Calvin D. Padgett, Waldo, Fla., assignors to Calgon Corporation, Pittsburgh, Pa.
No Drawing. Filed Aug. 21, 1968, Ser. No. 754,457
Int. Cl. C07f *7/10*
U.S. Cl. 260—448.2N **3 Claims**

Certain fluorosilazanes and chlorosilanes are disclosed. The new compounds are of the formulas



in which x is 0–10 and R_1 and R_2 are independently selected alkyl groups. They are useful as oil and water repellents and as derivatizing agents to facilitate gas-liquid chromatographic analyses.

3,579,558
PROCESS FOR THE PRODUCTION OF ω-AMINOALKANE NITRILES
Otto Immel, Krefeld-Uerdingen, Hans-Helmut Schwarz, Krefeld-Bockum, and Hermann Schnell, Krefeld-Uerdingen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Sept. 25, 1968, Ser. No. 762,630
Claims priority, application Germany, Oct. 14, 1967, F 53,775, F 53,776
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.2 **5 Claims**

Process of producing ω-aminoalkane nitriles by heating corresponding lactams with a stoichiometric excess of ammonia in the gaseous phase in the presence of a catalytic amount of a solid catalyst, said catalyst consisting essentially of magnesium silicate, calcium silicate, zinc silicate, aluminum silicate, manganese silicate, iron silicate, fluorinated aluminum oxide, fluorinated magnesium silicate, fluorinated calcium silicate, fluorinated zinc silicate, fluorinated aluminum silicate, fluorinated manganese silicate or fluorinated iron silicate.

3,579,559
PREPARING MUCONONITRILE FROM BENZENE
Manfred Otto Unger, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed May 29, 1968, Ser. No. 732,873
Int. Cl. C07c *121/02*
U.S. Cl. 260—465.3 **4 Claims**

Vapor phase reaction of benzene with ammonia and oxygen at above 300° C. to produce muconontrile.

3,579,560
ISOMERIZATION OF NITRILES
William Charles Drinkard, Jr., Wilmington, Del., and Brian W. Taylor, Pittsburgh, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of application Ser. No. 680,969, Nov. 6, 1967. This application Oct. 28, 1968, Ser. No. 771,313
Int. Cl. C07c *121/30*
U.S. Cl. 260—465.9 **20 Claims**

Process of isomerizing 2-methyl-3-butenenitrile to 3-pentenenitriles and 3-pentenenitriles to 4-pentenenitrile using a compound of cobalt or rhodium in conjunction with an oxidizing agent or reducing agent present in an amount such that the cobalt or rhodium has an effective valence below +2 and generally of from 0.25 to 1.75 as catalyst and of adding hydrogen cyanide to carbon-carbon double bonds such as in 4-pentenenitrile at from −25 to 200° C. using the same cobalt or rhodium catalyst system.

3,579,561
HYDROXYBENZYL-SUBSTITUTED BIS-PHENYL CARBONATES
Bernard R. Meltsner, Royal Oak, Mich., assignor to Ethyl Corporation, New York, N.Y.
No Drawing. Filed July 9, 1965, Ser. No. 470,890
Int. Cl. C07c *69/00*
U.S. Cl. 260—463 **10 Claims**

Hydroxybenzylphenyl carbonates and carboxylates are useful as stabilizers for organic material. They may be used alone or in combination with a dihydrocarbylthiodialkanoate.

3,579,562
PROCESS FOR HYDROFORMYLATING UNSATURATED ESTERS OR NITRILES
Wolfgang Weigert, Offenbach am Main, Germany, assignor to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany
No Drawing. Filed Dec. 17, 1965, Ser. No. 514,648
Claims priority, application Germany, Dec. 22, 1964, D 46,116; May 22, 1965, D 47,334
Int. Cl. C07c *121/34, 69/66*
U.S. Cl. 260—465.1 **14 Claims**

Methacrylic acid esters and nitrile are hydroformylated in the presence of a rhodium catalyst. α-formyl products predominate when reacting below 100° C. and β-formyl products predominate when reacting above 100° C.

3,579,563
PROCESS FOR THE HYDROGENATION OF MIXED NAPHTHALENE ESTERS AND COMPOSITIONS DERIVED THEREFROM
Philip W. Storms, Denver, and Grover L. Farrar, Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio
No Drawing. Filed Mar. 2, 1967, Ser. No. 619,950
Int. Cl. C07c *69/76*
U.S. Cl. 260—468 **12 Claims**

Hydrogenated derivatives of dimethylnaphthalenes are prepared by

(a) cracking a gas oil to form a light catalytic cycle oil having a boiling range between about 300 to 700° F.,
(b) hydrotreating said light catalytic cycle oil at temperatures of from about 600 to about 800° F. and pressures of from about 200 to about 1000 p.s.i.a. to form a hydrotreated cycle oil,
(c) extracting at least a portion of the aromatics from said hydrotreated cyclic oil,
(d) separating the extracted aromatics from the extracting solvent,
(e) oxidizing the extracted aromatics,
(f) hydrogenating the aromatics.

3,579,564
ESTERS OF 5-HYDROXYTETRACYCLINES
Robert K. Blackwood and Manfred Schach von Wittenau, Gales Ferry, Conn., assignors to Chas. Pfizer & Co., Inc., New York, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 439,974, Mar. 15, 1966. This application Feb. 3, 1969, Ser. No. 796,202
Int. Cl. C07c *103/19, 139/76;* **C07d** *5/20*
U.S. Cl. 260—473 **15 Claims**

Esters of oxytetracyclines including O^{12a}-esters of oxytetracycline, α- and β-6-deoxy-oxytetracycline, 6-demethyl-6-deoxy-6-methyleneoxytetracycline, the mercaptan adducts of the latter compound and acid addition and metal salts of said esters and their utility as antibacterial agents and as intermediates in the preparation of other biologically active compounds.

3,579,565
SULFONATE MONOMERS
Joel A. Zaslowsky and Henry Gould, Baltimore, Md., assignors to Alcolac Chemical Corporation, Baltimore, Md.
No Drawing. Filed June 12, 1967, Ser. No. 645,493
Int. Cl. C07c *69/54, 69/60*
U.S. Cl. 260—485 **3 Claims**

A new class of sulfonate monomers, both as new compositions of matter, and homopolymers and copolymers containing them.

3,579,566
REDUCTION OF ANHYDRIDES
Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
No Drawing. Filed Dec. 13, 1967, Ser. No. 690,067
Int. Cl. C07c *47/06, 69/16, 67/00*
U.S. Cl. 260—488 **10 Claims**

A process for reduction of organic acid anhydrides comprising reacting the anhydride with hydrogen in the presence of a catalyst comprising a complex of a Group VIII noble metal with a biphyllic ligand from the group consisting of organic phosphines, organic arsines and organic stibines.

3,579,567
TRICYCLO[4.4.0.0^{3,8}]DECAN-1-AMINE AND PROCESS FOR PREPARING SAME
Pierre Deslongchamps, Sherbrooke, Quebec, Canada, assignor to Ayerst, McKenna and Harrison Limited, Ville St. Laurent, Quebec, Canada
No Drawing. Filed July 10, 1968, Ser. No. 743,623
Int. Cl. C07c *69/14, 87/02, 103/32*
U.S. Cl. 260—488 **10 Claims**

There is disclosed herein tricyclo[4.4.0.0^{3,8}]decan-1-amine and the intermediates used in this preparation 8-hydroxytricyclo[4.4.0.0^{3,8}]decan-4-one acetate, 8-hydroxytricyclo[4.4.0.0^{3,8}]decan-4-one acetate thioketal, tricyclo[4.4.0.0^{3,8}]decan-1-ol acetate, tricyclo[4.4.0.0^{3,8}]decan-1-ol, and N-1-tricyclo[4.4.0.0^{3,8}]decanylacetamide. The compound possesses anti-viral properties, and methods for its use as well as a process for its preparation are also disclosed.

3,579,568
SYNTHESIS OF CARBOXYLIC ACIDS FROM ETHYLENE AND CARBON MONOXIDE AND NOBLE METAL COMPOUNDS
Richard F. Heck, Wilmington, and Patrick M. Henry, McDaniel Crest, Del., assignors to Hercules Powder Company, Wilmington, Del.
No Drawing. Original application Aug. 18, 1965, Ser. No. 480,809. Divided and this application Jan. 16, 1969, Ser. No. 791,789
Int. Cl. C07c *67/04*
U.S. Cl. 260—497 **4 Claims**

The disclosed process is a method for producing carboxylic acids by carbonylation of olefinic hydrocarbons.

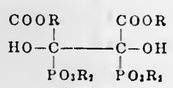
An olefin such as ethylene, and water or an acid such as acetic acid, are brought into contact with carbon monoxide in the presence of a compound of a Group VIII noble metal such as palladium at a temperature in the range of 25° to 250° C. Using ethylene and acetic acid as reactants, the product contains β-acetoxypropionic acid. A redox agent such as cupric chloride may be used to effect regeneration of the noble metal compound.

3,579,569
PREPARATION OF VINYL ACETATE
Stewart R. Montgomery, Silver Spring, and Melville E. Hillmann, Rockville, Md., assignors to W. R. Grace & Co., New York, N.Y.
No Drawing. Filed Oct. 6, 1967, Ser. No. 673,297
Int. Cl. C07c *67/04*
U.S. Cl. 260—497 **4 Claims**

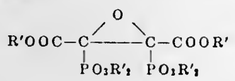
Vinyl acetate is produced by reacting ethylene and acetic acid in the vapor phase in the presence of a novel catalyst. The catalyst is solid titanium dioxide which has been treated with an aqueous solution of a basic material and with a solution of a soluble salt of a Group VIII noble metal. The Group VIII noble metal salt which deposited on the surface of the titanium dioxide is subsequently reduced to the metallic state with hydrogen.

3,579,570
ETHANE-1,2 - DICARBOXY - 1,2-DIHYDROXY-1,2-DIPHOSPHONIC ACID, LOWER ALKYL ESTERS, ALKALI METAL SALTS THEREOF AND PROCESS FOR PREPARING SAME
Denzel Allan Nicholson, Springfield Township, Hamilton County, Ohio, and Darrel Campbell, King of Prussia, Pa., assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Dec. 24, 1968, Ser. No. 786,765
Int. Cl. C07f *9/38;* **C11d** *3/08*
U.S. Cl. 260—502.4 **8 Claims**

Compounds having the formula



in which R is hydrogen, alkali metal, or an alkyl group having from 1 to about 6 carbon atoms, ammonium or alkanolammonium having 1 to 3 carbon atoms in each alkanol group by a process which comprises reacting an ester of ethane-1,2-dicarboxy-1,2-diphosphonic acid with an alkali metal hypohalite to form an epoxide compound having the formula



in which R′ is an alkyl group having from 1 to about 6 carbon atoms, and hydrolyzing said epoxide. The compounds are useful as detergency builders, sequestering agents and anti-calculus agents in oral compositions.

3,579,571
PROCESS FOR THE PREPARATION AND ISOLATION OF DEHYDROABIETIC ACID
Noah J. Halbrook and Ray V. Lawrence, Olustee, Fla., assignors to the United States of America as represented by the Secretary of Agriculture
No Drawing. Filed Nov. 13, 1967, Ser. No. 682,541
Int. Cl. C07c *61/30*
U.S. Cl. 260—514.5 **6 Claims**

Dehydroabietic acid is separated from rosin, other rosin acids, and rosin materials either present in rosin or formed in the disproportionation of rosin, by forming the 2-aminoethanol salt of dehydroabietic acid and recovering the pure acid from the amine salt.

3,579,572
PROCESS FOR THE PRODUCTION OF TEREPHTHALIC ACID
Garabed Amedjian, Maurice Fenoglio, and Michel Oberdorf, Lyon, France, assignors to Rhone-Poulenc S.A., Paris, France
No Drawing. Filed Jan. 5, 1968, Ser. No. 695,879
Int. Cl. C07c *63/26*
U.S. Cl. 260—515 **6 Claims**

Terephthalic acid is produced by treating aqueous lithium or magnesium terephthalate solution with carbon dioxide under pressure, and separating the precipitated terephthalic acid.

3,579,573
OXIDATION OF α,β-UNSATURATED ALDEHYDES TO THE CORRESPONDING UNSATURATED CARBOXYLIC ACIDS
Dieter Gilde, Hanau am Main, and Edgar Koberstein, Konstanz, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany
No Drawing. Filed Jan. 20, 1964, Ser. No. 338,610
Claims priority, application Germany, Jan. 29, 1963, D 40,744; Dec. 23, 1963, D 43,244
Int. Cl. C07c *51/26*
U.S. Cl. 260—530 **6 Claims**

Process for the production of α,β-unsaturated carboxylic acid by catalytic oxidation of α,β-unsaturated aldehydes in the gas phase with molecular oxygen using a mixture of phosphoric acid and vanadic acid in which the atomic ratio of phosphorus to vanadium is from 1:10 to 10:1 which may also contain antimony trioxide as oxidation catalyst.

3,579,574
PRODUCTION OF ACRYLIC ACID
Wilhelmus Teunis van der Meer, London, England, assignor to The Distillers Company Limited, Edinburgh, Scotland
No Drawing. Filed Jan. 22, 1965, Ser. No. 427,502
Claims priority, application Great Britain, Feb. 5, 1964, 4,804/64
Int. Cl. C07c *51/26, 51/32*
U.S. Cl. 260—530 **11 Claims**

Acrylic acid is prepared by the vapor phase oxidation of propylene or acrolein with oxygen in the presence of a catalyst consisting essentially of an oxide composition containing antimony and vanadium or antimony, vanadium and at least one polyvalent metal selected from the group of iron, manganese, chromium, cobalt, nickel, copper, zinc, cadmium, tungsten and thorium, the catalyst being heated to a temperature above 700° to about 900° C. in molecular oxygen gas before use.

3,579,575
PROCESS FOR OXIDIZING LOWER ALIPHATIC ALDEHYDES
Albert Bouniot, Melle, Deux-Sevres, France, assignor to Melle-Bezons, Melle, Deux-Sevres, France
No Drawing. Filed May 8, 1968, Ser. No. 727,705
Claims priority, application France, May 26, 1967, 107,982
Int. Cl. C07c *53/22*
U.S. Cl. 260—530 **14 Claims**

Process for oxidizing lower aliphatic aldehydes wherein the oxidation is carried out by passage of an oxygen containing gas through a liquid medium containing the aldehyde, in which the liquid medium comprises heterogeneous liquid phases, one of which is an aqueous phase.

3,579,576
ORGANOPHOSPHORUS COMPOUNDS AND A PROCESS FOR THE MAKING THEREOF
Howard P. Angstadt, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Feb. 25, 1964, Ser. No. 347,105
Int. Cl. C07f *9/34, 9/30*
U.S. Cl. 260—543P **19 Claims**

Compounds of the structure

(I)

(II)

and

(III)

where the R's are alkyl or cycloalkyl groups and X is halogen. Process of preparing these compounds from white phosphorus and an alkyl halide or cycloalkyl halide in a solvent such as carbon disulfide at from −80° C. to 100° C. in the presence of any of $AlCl_3$, $AlBr_3$, BF_3 $FeCl_3$ or $TiCl_4$ as catalyst followed by hydrolyzing the thus formed product with water at from 0° to 50° C. to produce the final product which is then separated from the reaction medium. When the alkyl or cycloalkyl halide is primary or secondary compounds of structures II and III as set forth above are formed and when tertiary alkyl or cycloalkyl halides are used compounds of structures I and II are formed.

3,579,577
METHOD OF PREPARING 4,5,6, HEXACHLOROTOLUYL CHLORIDE
Paul E. Hoch, Youngstown, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.
No Drawing. Continuation-in-part of abandoned application Ser. No. 818,517, June 8, 1959. This application Oct. 29, 1962, Ser. No. 233,885
Int. Cl. C07c *51/58*
U.S. Cl. 260—544 **2 Claims**

4,5,6,α,α,α-hexachlorotoluyl chloride is prepared by heating 3,4,5,6,7,7-hexachloro-3,6-menthano-1,2,3,6-tetrahydrophthaloyl chloride to at least 180° C. The toluyl chloride so produced is a useful chemical intermediate for making dyestuffs, herbicides, flame retardants and flameproofing agents.

3,579,578
3,4-DIHALO-3′ AND 4′-LOWER ALKYLCARBANILIDES
Edward J. Nikawitz, Glen Rock, and George R. Walter, Ho-Ho-Kus, N.J., assignors to Givaudan Corporation, Clifton, N.J.
No Drawing. Filed July 8, 1966, Ser. No. 563,673
Int. Cl. C07c *127/00*
U.S. Cl. 260—553 **10 Claims**

The present invention relates to novel 3,4-dihalo-3′- and 4′-lower alkyl carbanilides having bacteriostatic activity, a process for their manufacture, bacteriostatic compositions containing these compounds, synergistic basteriostatic compositions of the new compounds with hexachlorophene, and a method for controlling bacteria by the use of said compounds.

ERRATUM

For Class 260—555 see:
Patent No. 3,579,636

3,579,579
SUBSTITUTED 7- AND/OR 9-AMINO-6-DEMETHYL-6-DEOXYTETRACYCLINES
Joseph J. Hlavka, Tuxedo, Panayoto Bitha, New York, and Adma Schneller Ross and Michael Joseph Martell, Suffern, N.Y., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Apr. 18, 1968, Ser. No. 722,167
Int. Cl. C07c *103/19*
U.S. Cl. 260—559 **2 Claims**

This disclosure describes compounds of the class of 7- or 9-di(lower alkyl)amino-6-demethyl-6 - deoxytetracycylines and 7-monoalkylamino - 6 - demethyl-6-deoxytetracyclines useful as antibacterial agents.

3,579,580
PROCESS FOR PREPARING 1,4-BENZODIAZEPINES
Giles A. Archer, Essex Fells, and Leo Henryk Sternbach, Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Filed July 26, 1966, Ser. No. 567,827
Int. Cl. C07c *119/00*
U.S. Cl. 260—566 **5 Claims**

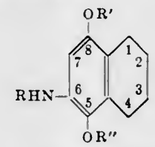
Preparation of 1,4-benzodiazepines via the reaction of 2 - (2 - amino - 5 -Y-α-phenylbenzylideneamino)ethanol wherein Y is selected from the group consisting of halogen, nitro, trifluoromethyl and hydrogen with a leaving group providing agent, e.g. thionyl chloride whereby to obtain the novel corresponding 2-(2-amino-5-Y-α-phenylbenzylideneamino)ethyl X wherein X is a leaving group and ring closing the last-mentioned compound whereby to obtain a 1,4-benzodiazepine. 1,4-benzodiazepines are known compounds of pharmacological utility, and are useful as anticonvulsant, muscle relaxant and sedative agents.

3,579,581
PREPARATION OF QUATERNARY AMMONIUM HYDROXIDES
Jim N. Maloney, Jr., Pensacola, and Ralph W. Smith, Gulf Breeze, Fla., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Continuation-in-part of application Ser. No. 711,200, Mar. 7, 1968. This application Apr. 3, 1968, Ser. No. 718,362
Int. Cl. C07c *85/00*
U.S. Cl. 260—567.6 **6 Claims**

Quaternary ammonium hydroxides can be prepared in high yield and purity from quaternary ammonium salts in the aqueous residue from extraction of an olefinic nitrile electrohydrodimerization effluent by contacting at least a portion of the aqueous residue with a basic anion exchange resin.

3,579,582
HYDROXY AND/OR HYDROCARBYLOXY AND AMINO SUBSTITUTED TETRAHYDRONAPHTHALENES
Ted Symon, Lombard, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Feb. 16, 1967, Ser. No. 616,474
Int. Cl. C07c *91/42*
U.S. Cl. 260—574 **8 Claims**

Compounds of the formula



where R, R′ and R″ are independently selected from hydrogen, alkyl, aralkyl, aryl, alkaryl or cycloalkyl. The compounds are useful as stabilizing additives in organic substrates such as lube oils, greases and polyolefin plastics.

3,579,583
PROCESS FOR PREPARATION OF N-METHYL-ALKYL AMINES
Horst Rutzen, Dusseldorf-Holthausen, Germany, assignor to Henkel & Cie., G.m.b.H., Dusseldorf-Holthausen, Germany
No Drawing. Filed Dec. 9, 1968, Ser. No. 782,426
Claims priority, application Germany, Dec. 7, 1967, H 64,693
Int. Cl. C07c *85/12*
U.S. Cl. 260—583 **10 Claims**

A new method of producing N-methyl-alkyl amines by hydrogenating a monocarboxylic acid or a dicarboxylic acid which will not form an internal anhydride at 200 to 400° C. in the presence of mono and/or dimethyl amine and an oxide catalyst.

3,579,584
PREPARATION OF AMINES
Horst Rutzen and Rolf Brockmann, Dusseldorf-Holthausen, Germany, assignors to Henkel & Cie, G.m.b.H., Dusseldorf, Germany
No Drawing. Filed Dec. 9, 1968, Ser. No. 782,427
Claims priority, application Germany, June 11, 1968, P 17 68 641.8
Int. Cl. C07c *85/00, 85/02, 85/12*
U.S. Cl. 260—583 **9 Claims**

A process for the preparation of amines having the formula

(I)

wherein R_1 and R_2 are selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms and R is selected from the group consisting of saturated and unsaturated straight and branch aliphatic and cycloaliphatic of 4 to 24 carbon atoms and aromatic of 6 to 24 carbon atoms which may be substituted with one

which comprises reacting a carboxylic acid ester in one step with a nitrogen compound of the formula

at a temperature of 200 to 400° C. in the presence of hydrogen which may be diluted with a reaction-insert gas at a pressure of 50 to 400 atmospheres and in the presence of a metal oxide catalyst in lump form selected from the group consisting of zinc oxide-chromium oxide and zinc oxide-aluminum oxide catalysts.

3,579,585
PREPARATION OF AMINES
Horst Rutzen, Dusseldorf-Holthausen, Germany, assignor to Henkel & Cie., G.m.b.H., Dusseldorf-Holthausen, Germany
No Drawing. Filed Dec. 9, 1968, Ser. No. 782,480
Claims priority, application Germany, Dec. 8, 1967, H 64,713
Int. Cl. C07c *85/00, 85/02, 85/12*
U.S. Cl. 260—583 **11 Claims**

A process for the preparation of aliphatic amines of the formula

wherein R is selected from the group consisting of saturated and unsaturated aliphatic radicals of 6 to 22 carbon atoms and R_1 and R_2 are selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms which comprises reacting a fatty acid glyceride having an R radical with a nitrogen compound of the formula

wherein R_1 and R_2 have the above definitions at 200 to 400° C. and a hydrogen pressure of 50 to 400 atmospheres in the presence of a metal oxide catalyst in lump form selected from the group consisting of zinc oxide-aluminum oxide and zinc oxide-chromium oxide catalysts.

3,579,586
PROCESS FOR THE PREPARATION OF THE DEXTROROTATORY 2,2′ - (ETHYLENE-DI-IMINO)-DI-1-BUTANOL
Giorgio Zoja, Milan, Italy, assignor to Laboratorio Chimico Farmaceutico Giorgio Zoja S.p.A., Milan, Italy
No Drawing. Filed Nov. 13, 1968, Ser. No. 775,508
Claims priority, application Germany, June 5, 1968, P 17 68 612.3
Int. Cl. C07c *89/04*
U.S. Cl. 260—584R **7 Claims**

A process for the production of highly pure, levoisomer free, (+) 2,2-ethylenediimino-di-1-butanol dihydrochloride involving resolution of (±) 2-amino-1-butanol (+) tartrates with boiling methanol, reaction of (+) 2-amino-1-butanol with ethylene dichloride and precipitating the intermediate product with gaseous hydrochloric acid to obtain the desired product.

3,579,587
PROCESS FOR THE PREPARATION OF THE DEXTROROTATORY 2,2′ - (ETHYLENE-DI-IMINO)-DI-1-BUTANOL
Giorgio Zoja, Milan, Italy, assignor to Laboratorio Chimico Farmaceutico Giorgio Zoja S.p.A., Milan, Italy
No Drawing. Filed Nov. 13, 1968, Ser. No. 775,536
Claims priority, application Great Britain, Apr. 18, 1968, 18,491/68
Int. Cl. C07c *89/00*
U.S. Cl. 260—584 **8 Claims**

A process for the production of pure (+)2,2′-(ethylenediimino)-di-1-butanol dihydrochloride formed by reacting a solution of (+)2-amino-1-butanol and (−)2-amino-1-butanol with (+)tartaric acid, separating the diastereoisomers by fractional crystallization using boiling methyl alcohol and reacting the highly pure (+)2-amino-1-butanol (+)hydrogen tartarate with ethylene dichloride in the presence of an inert organic solvent and a calcium compound, concentrating the reaction solution, removing insoluble calcium salts and saturating with gaseous HCl to precipitate (+)2,2′-(ethylenediimino)-di-1-butanol dihydrochloride.

3,579,588
6,6,7,7-TETRACHLOROBICYCLO(3.2.0) HEPTAN-2-ONE
Wendell L. Dilling, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed July 24, 1968, Ser. No. 747,116
Int. Cl. C07c *49/00;* **B01j** *1/10*
U.S. Cl. 260—586 **1 Claim**

The present disclosure is directed to the compound 6,6,7,7-tetrachlorobicyclo(3.2.0)heptan-2-one, its method of preparation as well as its use as a bactericide and fungicide.

3,579,589
PROCESS FOR MANUFACTURING A CATALYST, RESULTING CATALYST AND PROCESS FOR MANUFACTURE OF BENZOIC ALDEHYDE FROM TOLUENE IN THE PRESENCE OF SAID CATALYST
Bernard Delmon, Seyssins, France, assignor to Institut Francais du Petrole des Carburants et Lubrifiants, Ruell Malmaison, France
No Drawing. Filed Sept. 5, 1968, Ser. No. 757,755
Claims priority, application France, Sept. 13, 1967, 120,933
Int. Cl. C07c *47/48, 47/52*
U.S. Cl. 260—599 **19 Claims**

Process for manufacturing a catalyst used for oxidizing toluene to benzaldehyde, which process comprises admixing an uranium oxide or salt with a molybdenum oxide or salt in the presence of sulfuric acid, drying and calcinating the resulting mixture.

Optionally, there can be added to the mixture, before drying and calcinating, an alkaline or alkaline-earth metal compound and/or metals or compounds of metals such as chromium, tungsten, silver, copper, yttrium, cerium and other elements from the group of the rare earths.

3,579,590
METHOD OF PREPARING DIARYL SULFONES
David S. Davis, West Orange, N.J., assignor to Witco Chemical Corporation, New York, N.Y.
No Drawing. Filed Dec. 12, 1967, Ser. No. 689,809
Int. Cl. C07c *147/06*
U.S. Cl. 260—607 **5 Claims**

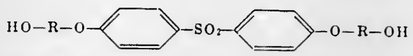
Production of diaryl sulfones having the formula

$$R—SO_2—R$$

by reacting in admixture (a) aryl compounds having the formula RH wherein R represents an aryl hydrocarbon such as benezne or naphthalene in which the nuclear carbon atoms have their outer valences satisfied by hydrogen or one or more of alkyl (including cycloalkyl), alkoxy, thioalkyl, halogen, phenyl, substituted phenyl, phenoxy, and substituted phenoxy groups and mixtures thereof (b) anhydrous sulfonating agents as, for instance, fluorosulfonic acid, sulfur trioxide, chlorosulfonic acid and mixtures thereof, and (c) at least 0.04 mole of a non-metallic condensing agent for instance, P_2O_5, phosphorus pentachloride, phosphorus oxychloride, and boric anhydride, per mole of sulfonating agent, said diaryl sulfones being produced in high yield and having a high degree of purity, free from metallic impurities.

3,579,591
4,4′-BIS-(HYDROXYARLOXY)-PHENYLSULFONE
Hermann Schnell and Gerhard Darsow, Krefeld-Uerdingen, and Ludwig Bottenbruch, Krefeld-Bockum, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Continuation-in-part of application Ser. No. 620,233, Mar. 3, 1967. This application Oct. 8, 1968, Ser. No. 765,993
Claims priority, application Germany, Mar. 18, 1966, F 53,836
Int. Cl. C07c *142/10, 51/00;* **C08a** *22/14*
U.S. Cl. 260—607 **5 Claims**

Aryl ethers of the formula



wherein R is a bivalent aromatic radical and the utility thereof as intermediates for reaction with carboxylic acid halides, dicarboxylic acid dihalides, isocyanates and polyisocyanates to produce, respectively, diesters, polyesters, diurethanes and polyurethanes. The aforesaid ethers are prepared by reacting 1 mol of 4,4′-dihalo-diphenylsulphone with about 2 mols diphenolate at a temperature between about 100 and 160° C. and acidifying resulting product.

3,579,592
1-ALLYLTHIO-3-CHLORO-2-PROPANOL
Leonard Levine, Lake Jackson, and Russell T. McFadden, Freeport, Tex., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Oct. 22, 1968, Ser. No. 769,706
Int. Cl. C07c *149/18;* **A61k** *27/00;* **C08f** *15/00*
U.S. Cl. 260—609 **4 Claims**

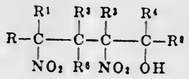
1-allylthio-3-halo-2-propanol is made by reacting an allyl halide with 1-mercapto-3-halo-2-propanol, wherein the halogen in each reactant has an atomic weight of at least 35, in the presence of a hydrogen halide acceptor. The compound is used as an anthelmintic.

3,579,593
PROCESS FOR PREPARING BETA-PHENYLETHYL ALCOHOL
Thomas F. Wood, Wayne, N.J., assignor to Givaudan Corporation, Clifton, N.J.
No Drawing. Filed Apr. 18, 1968, Ser. No. 722,224
Int. Cl. C07c *29/00*
U.S. Cl. 260—618 **6 Claims**

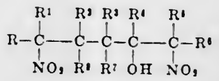
β-Phenylethyl alcohol suitable for perfumery use is prepared in excellent yields by the hydrogenation of styrene oxide in the presence of the two catalysts: Raney nickel and palladium, and fractionally distilling the alcohol.

3,579,594
PREPARATION OF DINITRO ALCOHOLS
John M. Larkin, Hopewell Junction, N.Y., assignor to Texaco Inc., New York, N.Y.
No Drawing. Filed Nov. 30, 1967, Ser. No. 686,820
Int. Cl. C07c *79/18, 87/04*
U.S. Cl. 260—632 **14 Claims**

A method for preparing dinitro alcohols having at least 4 carbon atoms by heating a vicinal nitroalkyl nitrate having at least 4 carbon atoms at a temperature of at least 100° C. The dinitro alcohols so prepared correspond to the formulas:



and



and are useful as solvents, plasticizers, bactericides, lubricants and fuel additives.

3,579,595
1-BROMO-1-CHLORO-2,3,3-TRIFLUOROPROPENE AND METHOD OF PREPARING SAME
Bernard M. Regan, Chicago, Ill., assignor to Baxter Laboratories, Inc., Morton Grove, Ill.
No Drawing. Filed Jan. 19, 1968, Ser. No. 699,060
The portion of the term of the patent subsequent to Mar. 3, 1987, has been disclaimed
Int. Cl. C07c *17/34, 21/18*
U.S. Cl. 260—653.3 **2 Claims**

1-bromo-1-chloro-2,3,3-trifluoropropene, useful as a general anesthetic.

3,579,596
HYDROGENOLYSIS OF CARBON TETRACHLORIDE AND CHLOROFORM
Charles R. Mullin and C. Elmer Wymore, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Mar. 29, 1968, Ser. No. 717,383
Int. Cl. C07c *17/06*
U.S. Cl. 260—658 **12 Claims**

A process for the selective vapor phase dechlorination of carbon tetrachloride and chloroform, resulting in lower chlorinated methanes, which comprises:

(A) Reacting carbon tetrachloride with an excess of hydrogen, at a temperature below 200° C. and a liquid hourly space velocity of 0.1 to 10, in the presence of a catalyst chosen from the metals Ru, Rh, Pd, Os, Ir, Pt, Cu, Ag, or Au, to produce predominantly chloroform; or

(B) Reacting carbon tetrachloride with an excess of hydrogen, at a temperature of 125° to 350° C. and a liquid hourly space velocity of 0.5 to 10, in the presence of one of the catalysts of (A) above, to produce predominantly methylene chloride; or

(C) Reacting chloroform with an excess of hydrogen, at a temperature of 75° to 350° C. and a liquid hourly space velocity of 0.1 to 10, in the presence of one of the catalysts of (A) above, to produce predominantly methylene chloride.

3,579,597
PREPARATION OF C_2 SATURATED CHLORINATED COMPOUNDS BY OXYCHLORINATION OF ETHYLENE AND VINYL CHLORIDE WITH A FLUID BED CATALYST
Albert Antonini and Philippe Joffre, Paris, and Claude Vrillon, Montmagny, France, assignors to Produits Chimiques Pechiney-Saint-Gobain, Paris, France
No Drawing. Filed May 20, 1968, Ser. No. 730,611
Claims priority, application France, May 19, 1967, 106,971
Int. Cl. C07c *17/06*
U.S. Cl. 260—658R **16 Claims**

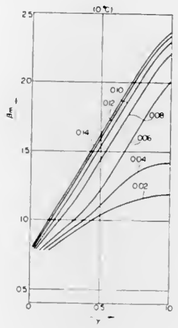
A process for the preparation of 1,2-dichloroethane, 1,1,2-trichloroethane, 1,1,2,2-tetrachloroethane and pentachloroethane simultaneously by oxychlorination of ethylene and vinyl chloride in admixture with a fluidized bed catalyst.

3,579,598
DEHYDROCYCLIZATION PROCESS AND CATALYST
Rowland C. Hansford, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.
No Drawing. Filed Aug. 14, 1967, Ser. No. 660,240
Int. Cl. C07c *5/18, 15/02;* **B01j** *11/16*
U.S. Cl. 260—673.5 **7 Claims**

Paraffin hydrocarbons are converted to aromatic hydrocarbons by dehydrocyclization at elevated temperatures and low pressures, in the presence of added hydrogen and a catalyst comprising minor proportions of a Group VIII noble metal and at least one oxide of the metals calcium, strontium, or barium, supported on a silica gel base.

3,579,599
PROCESS FOR EXTRACT-SEPARATION OF AROMATIC HYDROCARBONS
Yoshiro Ito, Tamotsu Ueno, Takashi Nakano, and Kazuo Okamoto, Kurashiki-shi, Japan, assignors to Japan Gas-Chemical Company, Inc., Tokyo, Japan
Filed Nov. 18, 1968, Ser. No. 776,728
Claims priority, application Japan, Nov. 21, 1967, 42/74,896
Int. Cl. C07c *7/10*
U.S. Cl. 260—674 **10 Claims**

A process for extract-separating aromatic hydrocarbons having larger basicity into a hydrogen fluoride phase by allowing an extracting agent consisting of hydrogen fluoride and boron trifluoride to come in contact with a mixture containing two or more aromatic hydrocarbons having different basicity from each other. More particularly, a process for extract-separating aromatic hydrocarbons in a

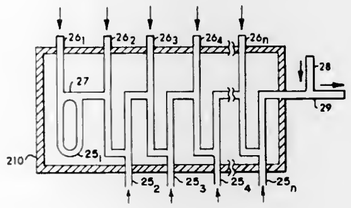


high yield and purity without substantially refluxing said aromatic hydrocarbon having larger basicity, heretofore considered a necessity, by feeding extracting agent consisting of HF and BF_3, and diluent in highly precise amounts according to a predetermined correlation.

3,579,600
CATALYST FOR THE INTERCONVERSION OF PROPYNE AND PROPADIENE
Richard T. Dickerson, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Nov. 8, 1968, Ser. No. 774,487
Int. Cl. C07c *11/14, 11/22*
U.S. Cl. 260—678 **10 Claims**

Propyne and propadiene are catalytically interconverted by a mixture of a highly polar solvent, e.g. dimethyl sulfoxide, and a base, e.g. potassium hydroxide. This process facilitates the conversion of C_3H_4 mixtures entirely to either propyne or propadiene as may be required for specific chemical application.

3,579,601
PYROLYSIS OF HYDROCARBONS
John A. Kivlen, Sparta, N.J., assignor to Esso Research and Engineering Company
Filed June 10, 1968, Ser. No. 738,716
Int. Cl. C07c *3/08;* **C10g** *9/20, 9/14*
U.S. Cl. 260—683 **12 Claims**

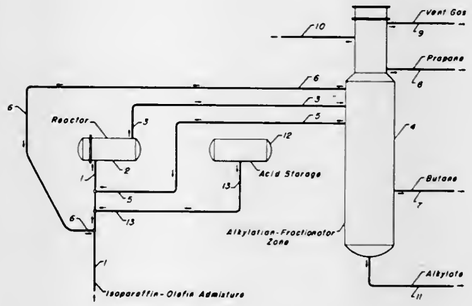


This invention relates to process and apparatus for the pyrolysis, or thermal cracking, of hydrocarbons or hydrocarbon feedstocks to produce products useful as chemical raw materials or fuels. In particular, mobile hydrocarbons, i.e., normally gaseous or liquid paraffinic hydrocarbons, or other suitable feedstocks, are cracked to obtain unsaturated hydrocarbon compounds, particularly olefins. Faster reaction rates, increased product yields, and better selectivities are obtained by thermally cracking (with or without steam) a raw, or fresh hydrocarbon feed in admixture with a stream of hot reacting, thermally cracked (with or without steam) product. The process is thus characterized by steps wherein a feed is thermally cracked to form at least partially converted products, and fresh feed, which preferably is preheated to supply some of the needed sensible and reaction heat, is thermally cracked in admixture with the said at least partially converted products. In one embodiment, fresh hydrocarbon feed, and steam if desired, is preheated and fed at spaced locations through a tubular reactor, or reaction zone, resulting in fresh feed being contacted with at least partially converted products from a preceding portion of the tubular reactor, or reaction zone (except for the portion introduced at the entrance to the reactor).

3,579,602
OLEFIN CONVERSION PROCESS AND CATALYSTS THEREFOR
Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Filed Apr. 3, 1967, Ser. No. 627,638
Int. Cl. C07c *5/00*
U.S. Cl. 260—683 **10 Claims**

Olefins are converted into other olefins of different molecular weight by contact with an olefin reaction catalyst, having activity for disproportionating propylene into ethylene and butene, which catalyst has been treated with an inorganic base or a material convertible to an inorganic base, followed by treatment with a stream of hydrogen, carbon monoxide, a gaseous acyclic olefin or a gaseous paraffin.

3,579,603
PROCESS UTILIZING LIQUID ACID SETTLING IN AN ALKYLATION-FRACTIONATOR
Edwin K. Jones, Kenilworth, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
Filed June 4, 1969, Ser. No. 830,344
Int. Cl. C07c *3/54*
U.S. Cl. 260—683.48 **10 Claims**



An isoparaffin-olefin admixture is alkylated with a liquid acid alkylation catalyst (HF or H_2SO_4) and the total reaction effluent from the alkylator is passed to an alkylation-fractionator vessel which provides a settling zone therein for separating the liquid catalyst. The hydrocarbon phase undergoes fractionation and separate fractions are removed from above and below the settling zone. The process produces high octane alkylated hydrocarbons utilizing a simplified flow scheme where a single vessel separates the total reaction effluent.

3,579,604
ISOMERIZATION OF OCTALINS
Anthony L. Tumolo, Havertown, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Apr. 27, 1970, Ser. No. 32,363
Int. Cl. C07c *13/08*
U.S. Cl. 260—666 **4 Claims**

An octalin is isomerized to another octalin, in particular 1,9-octalin to 9,10-octalin, by contact, preferably in a nonaqueous system, with strongly acidic ion exchange resin having a macroporous structure.

3,579,605
ISOMERIZATION OF OCTALINS
Anthony L. Tumolo, Havertown, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Filed Apr. 27, 1970, Ser. No. 32,436
Int. Cl. C07c *13/28*
U.S. Cl. 260—666 **6 Claims**

An octalin is isomerized to another octalin, in particular, 1,9-octalin to 9,10-octalin, by contact with a catalyst combination comprising silica gel and a hydrogen halide, or sulfuric acid, or phosphoric acid.

3,579,606
N-DECATRIENE ISOMERIZATION
Wilfried Umbach, Langenfeld, Germany, assignor to Henkel & Cie, GmbH, Dusseldorf-Holthausen, Germany
No Drawing. Filed Apr. 10, 1969, Ser. No. 815,185
Claims priority, application Germany, June 29, 1968, P 17 68 792.2
Int. Cl. C07c *11/00*
U.S. Cl. 260—677 **3 Claims**

As a new compound, n-decatriene-1,6,8, useful as a modifier for coating agents, particularly for reducing the dust drying time of air-drying alkyd resin coating agents.

3,579,607
POLYESTER-SUBSTITUTED ORGANOSILICON COMPOSITIONS
Markus Matzner, Edison, and Allen Noshay, East Brunswick, N.J., assignors to Union Carbide Corporation, New York, N.Y.
No Drawing. Filed Jan. 17, 1969, Ser. No. 792,132
Int. Cl. C08g *39/10, 47/10, 17/13*
U.S. Cl. 260—824 **13 Claims**

This invention relates to cyclobutane diol polyester-substituted organosilicon compositions characterized by a polymeric segment or block that is composed of recurring cyclobutylene groups linked to each other through carbonate linkages (—OCOO—) or di(carbonyloxy)hydrocarbylene linkages and that is chemically bonded to a silicon atom. The novel compositions have a silicon-containing segment derived from a silane or a siloxane. In the latter case, the compositions are block copolymers. The compositions are stable to heat and light and are useful as protective coatings, molding resins and elastomers.

3,579,608
WIRE COATING OF BROMINATED DIGLYCIDYL ETHER OF BISPHENOL A AND POLYVINYL CHLORIDE
John B. De Coste, Basking Ridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 26, 1968, Ser. No. 755,124
Int. Cl. C08g *45/04*
U.S. Cl. 260—837 **4 Claims**

An abrasion resistant, insulating wire coating comprises plasticized vinyl chloride and a brominated bisphenol epoxy resin.

3,579,609
FLEX-RESISTANT POLYESTER FILM CONTAINING OLEFIN OR POLYTETRAMETHYLENE OXIDE ADDITIVE POLYMER
Robert J. Sevenich, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Filed Sept. 23, 1968, Ser. No. 761,786
Int. Cl. C08g *39/10, 51/54*
U.S. Cl. 260—873 **6 Claims**

Physically blending minor amounts of fusible heat-stable polymers of lower-mono-alpha olefin or tetramethylene oxide into polyester resin which is to be extruded into a film and thereafter oriented, imparts unexpectedly superior flex resistance to the ultimate film. The film also displays excellent "slip" and, in many instances, improved electrical properties. Among the suitable additive polymers are polyethylene, polypropylene, polybutylene, poly-4-methyl pentene, ethylene vinyl acetate copolymer, ethylene propylene copolymers and polytetramethylene oxide.

3,579,610
PROTECTIVE AND DECORATIVE THERMO-SETTING COATING
John Christos Petropoulos, Norwalk, and Ralph Earl Layman, Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Oct. 2, 1968, Ser. No. 764,595
Int. Cl. C08g *37/32;* **C08f** *37/18, 29/22*
U.S. Cl. 260—853 **10 Claims**

A coating composition comprising an acrylic resin, polyvinylidene fluoride and hexakismethoxymethyl melamine is disclosed.

3,579,611
CROSSLINKED POLYOXYETHYLENES AND PROCESS THEREFOR
Fred F. Holub and Moyer M. Safford, Schenectady, N.Y., assignors to General Electric Company
No Drawing. Filed Dec. 26, 1967, Ser. No. 693,166
Int. Cl. C08f *29/50, 27/00*
U.S. Cl. 260—874 **10 Claims**

Polyoxyethylenes are mixed with an organic crosslinking agent and an organic peroxide and heated at elevated temperatures to crosslink the polyoxyethylene to yield a water-insoluble polymer. These crosslinked polyoxyethylene compositions are useful as membrane material, wire coating, and the like and as water-insoluble coatings for cloth, metal, metallic screen, etc.

3,579,612
SUSPENSION SYSTEM FOR PRODUCING HIGH IMPACT POLYSTYRENE
Arthur I. Lowell, Edison, N.J., assignor to Mobil Oil Corporation
No Drawing. Filed Sept. 3, 1968, Ser. No. 757,152
Int. Cl. C08f *1/11, 15/04*
U.S. Cl. 260—880 **2 Claims**

In the preparation of high impact polystyrene by bulk prepolymerization of a rubber in a styrene followed by aqueous suspension polymerization using water-soluble suspending agents, excessive foaming and emulsification occurs. These difficulties are reduced by using in the suspension system a combination of a water-soluble hydroperoxide and a water-soluble metal formaldehyde sulfoxylate or its equivalent, together with the water-soluble suspension agent.

3,579,613
POLYSALTS CONTAINING SULFONATED ACRYLICS
Raymond J. Schaper, Pittsburgh, and Merwin Frederick Hoover, Bethel Park, Pa., assignors to Calgon Corporation
No Drawing. Filed Nov. 16, 1967, Ser. No. 683,467
Int. Cl. C08f *29/50, 33/08*
U.S. Cl. 260—901 **3 Claims**

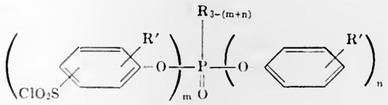
Poly(sulfonated acrylics) are reacted with various cationic polymers to form polysalts.

3,579,614
2-CYANOVINYL PHOSPHATES AND PHOSPHOROTHIOATES
Bernard Miller, Plainsboro, and Howard Margulies, Princeton Junction, N.J., assignors to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed Aug. 8, 1967, Ser. No. 659,014
Int. Cl. C07f *9/08;* **A01n** *9/36*
U.S. Cl. 260—940 **9 Claims**

The present invention relates to novel 2-cyanovinyl phosphates and phosphorothioates and their isomers, a method for their preparation and the use of said compounds for control of pests which damage or destroy agronomic crops and/or spread infection or disease to man, animal and bird populations.

3,579,615
PHOSPHORUS-CONTAINING SULFONYL-CHLORIDES
John E. Herweh and Algirdas C. Poshkus, Lancaster, Pa., assignors to Armstrong Cork Company, Lancaster, Pa.
No Drawing. Original application Apr. 6, 1966, Ser. No. 540,486, now Patent No. 3,423,485, dated Jan. 21, 1969. Divided and this application June 24, 1968, Ser. No. 765,716
Int. Cl. C07f *9/12, 9/40*
U.S. Cl. 260—947 **3 Claims**

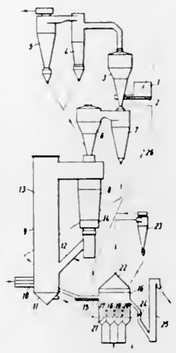
A class of chlorosulfonated phosphorus esters of the formula:



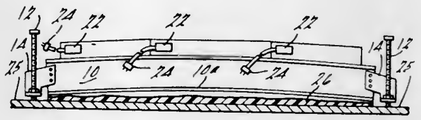
where R may be lower alkyl; R′ may be Cl, NO_2, lower alkyl and H; *m* is an integer from 1 to 3; *n* is an integer from 0 to 2; and the sum of $m+n$ is an integer from 1 to 3. These compounds find utility as intermediates in the formation of sulfonylhydrazides by reaction with hydrazine. The sulfonyl-hydrazides are useful as blowing agents for resinous blends.

3,579,616
METHOD OF CARRYING OUT ENDOTHERMIC PROCESSES
Lothar Reh, Bergen-Enkheim, Karlheinz Rosenthal, Neu Isenburg, and Hans Werner Schmidt, Frankfurt am Main, Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany
Filed May 5, 1969, Ser. No. 821,773
Claims priority, application Germany, May 30, 1968, P 17 67 628.7
Int. Cl. F26b *3/08;* **F27b** *15/00*
U.S. Cl. 263—52 **8 Claims**

In an endothermic process, raw solids are first dried in a suspension-type heat-exchanger system by hot gas coming from a fluidized-bed furnace with material recycling and then introduced into the fluidized bed. Hot solids taken from the fluidized bed are used in a heat exchanger to preheat fresh air which is used as the fluidizing gas for the fluidized bed. Another portion of air is also heated in the heat exchanger and introduced in the fluidized bed as secondary air.



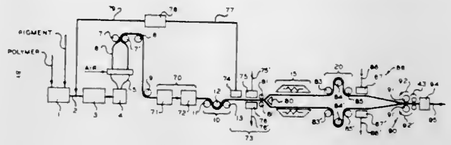
3,579,617
METHOD OF INSTALLING SURFACE PLATE
Robert H. Smith, Birmingham, Robert K. Payne, Troy, and Thomas Haw III, Detroit, Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed Dec. 2, 1968, Ser. No. 780,529
Int. Cl. B32b *31/06;* **E04b** *1/16*
U.S. Cl. 264—34 **6 Claims**



A method of providing a perfectly flat surface plate for use as a measurement reference plane in styling automobiles, wherein a magnetic fixture having a flat lower magnetic face is positioned over the floor on which it is desired to provide the surface plate and a strip of cold rolled steel is positioned against the flat lower magnetic face of the fixture; the magnetic force generated by the fixture forces the strip to conform to the flatness of the magnetic face and the strip is thereafter set in place by filling the space between the strip and the base surface with an epoxy adhesive which, when hardened, serves to maintain the strip in the flat configuration imparted to it by the magnetic fixture.

3,579,618
HIGH SPEED FIBRILLATION PROCESS
Dan F. Stewart, Bob C. Blair, Max E. Greene, and Lloyd R. Alexander, Bartlesville, Okla., assignors to Phillips Petroleum Company
Filed Aug. 9, 1968, Ser. No. 751,458
Int. Cl. B29c *17/14;* **B29d** *7/24;* **D01d** *5/00*
U.S. Cl. 264—37 **4 Claims**

A process for forming a fibrillated product comprising forming a film from a flattened plastic tube, molecularly orienting the film and fibrillating the oriented film, wherein vacuum means remove from the system any loose ends of ribbons that may become severed during orientation,

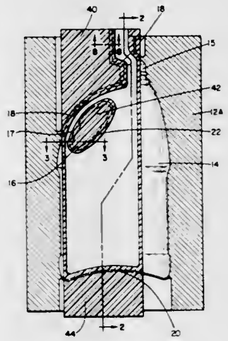


preventing such severed ribbons from becoming entangled in the stretching rolls.

3,579,619
ROASTING MARL TO PRODUCE A POZZOLANA MATERIAL
Dietrich Harkort, Am Schwalbenschwanz 56; and Rudolf Rasch, Georg-Speyer-Strasse 86, both of 6 Frankfurt am Main, Germany; Rolf Iberg, Chapfstrasse 19, CH-8142 Uitikon, Switzerland; and Jurg H. Heberlein, Rohrhaldenstrasse 41, CH-8712 Stafa, Switzerland
No Drawing. Filed Aug. 23, 1968, Ser. No. 754,993
Claims priority, application Germany, Aug. 25, 1967, B 94,148
Int. Cl. C04b *7/12, 7/44*
U.S. Cl. 264—42 **2 Claims**

Construction materials of high strength and low volumetric weight are formed by hardening in an autoclave at about 165° and at an atmospheric pressure and for a time such that the multiplicand equals about 65 atmosphere hours a thermally active earth mixed with water. The earth or "washed clay" is a mineral substance or marl comprising by weight calcium carbonate (10–30%), clay minerals (40–70%) and quartz (20–50%) having about a 1:1 ratio of $CaO:SiO_2$ and a TiO_2 content of 0.2 to 3%. The marl is first roasted at a temperature below its melting phase (700–900° C.) and crushed to a grain size of 4 to 6 mm. 4–8% by weight of portland cement, lime or hydraulic lime is added before hardening to give increased compression strength to the final construction material.

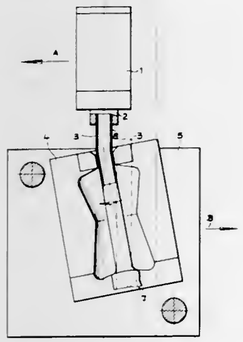
3,579,620
BLOW MOLDING
Lennart K. Pettersson, Bloomfield, Conn., assignor to Monsanto Company, St. Louis, Mo.
Filed Nov. 26, 1968, Ser. No. 778,995
Int. Cl. B29c *17/07*
U.S. Cl. 264—98 **15 Claims**



Parison pinch off surfaces of a blow mold and/or the area of the mold defining an opening extending through the body of a handleware container are kept at elevated temperature in comparison with remaining cooled portions of the mold during closing of the mold sections and

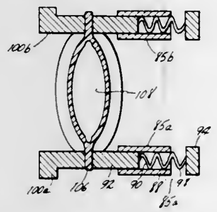
formation of the article, in order to facilitate subsequent removal of waste flash which is integrally formed with the article in these areas of the mold.

3,579,621
METHOD AND APPARATUS FOR FORMING HOLLOW PLASTIC ARTICLES
Gottfried Mehnert, Berlin-Mariendorf, Germany, assignor to Conduco AG, Zug, Switzerland
Filed Nov. 7, 1968, Ser. No. 774,091
Claims priority, application Germany, Nov. 10, 1967, P 17 04 209.0
Int. Cl. B29c *17/06, 17/07, 23/00*
U.S. Cl. 264—99 **13 Claims**



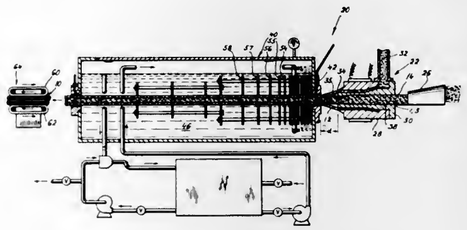
The extruder of a blow molding apparatus extrudes a tubular blank and moves continuously with reference to a series of sectional blow molds or vice versa. The movements of mold sections to closed positions are timed in such a way that the upper end of the extruded portion of the blank is clampingly engaged by the mold sections later than the lower end or vice versa, always with such a delay that the axis of the thus engaged portion of the blank is coaxial with the mold cavity. This is achieved by pivoting the mold sections between upright and inclined positions or by providing the mold sections with movable upper or lower blank-engaging parts.

3,579,622
METHOD FOR BLOW MOLDING PLASTIC ARTICLES
Charles H. Shaw, Bloomfield, and Robert G. Strauss, West Hartford, Conn., assignors to Monsanto Company, St. Louis, Mo.
Original application Oct. 17, 1966, Ser. No. 587,255, now Patent No. 3,509,596, dated May 5, 1970. Divided and this application Apr. 10, 1969, Ser. No. 839,746
Int. Cl. B29c *17/07*
U.S. Cl. 264—99 **1 Claim**



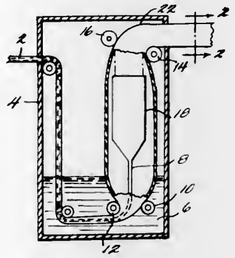
A method of blow molding a hollow article wherein the parison is preblown and then allowed to partially deflate and shrink in size to obtain the benefit of stretching during pre-inflation while avoiding chill marks in the finished article.

3,579,623
FORMING FILLED CONTINUOUS PLASTIC ROD SUCH AS PLASTIC CIGARETTE FILTER ROD FILLED WITH A TOW OF CELLULOSE ACETATE
Richard N. Thomson, Jerome S. Osmalov, and George L. Mathe, Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.
Filed July 24, 1968, Ser. No. 747,279
Int. Cl. B29d *9/00, 23/14*
U.S. Cl. 264—135 **3 Claims**



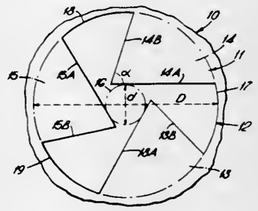
A method with which a continuous length, tubular article filled with a gas or liquid pervious filler material such as a tow filled plastic cigarette filter rod is formed by extruding plastic as a sheath around an advancing bloomed tow of fibrous filter material, heat from the plastic extrudate being utilized in the course of the forming operations to accelerate curing of a plasticizer impregnating the tow. A crosshead type extrusion die is utilized for the forming operation and is provided with a central tube extending longitudinally therein for receiving the advancing tow and isolating it from the molten plastic with which the extrudate is formed, the latter entering the die laterally and issuing from the mouth thereof as a continuous tubular sheath which makes first contact with the tow at a distance downstream of the die mouth. The extrudate on leaving the crosshead die is then sized by passing it through a cooling chamber wherein the external dimension of the plastic sheath is accurately controlled within predetermined limits.

3,579,624
INSULATED ALKALI METAL CONDUCTOR
Alvin Guttag, Bethesda, Md., assignor to Weston Chemical Corporation, New York, N.Y.
Original application Sept. 25, 1967, Ser. No. 670,166. Divided and this application Mar. 7, 1969, Ser. No. 828,037
Int. Cl. B29c *27/20;* **B29f** *3/10;* **D01d** *5/16*
U.S. Cl. 264—171 **19 Claims**



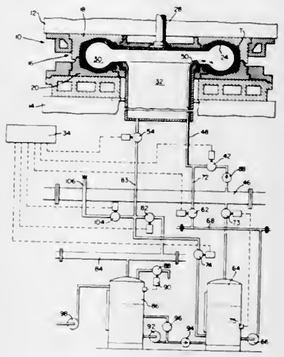
Electrical conductors comprising an alkali metal conducting core are coated with a preformed heat shrinkable inert olefin hydrocarbon polymer film or sheet and the hydrocarbon shrunk into tight engagement with the alkali metal. The heat of the molten metal or of the metal while it is cooling can be used to shrink the polymer.

3,579,625
PROCESS FOR FORMING TRILOBAL YARNS
Jean-Louis Jacquinet, Lyon, Rhone, France, assignor to Société Rhodiaceta
Filed Sept. 27, 1967, Ser. No. 670,862
Claims priority, application France, Sept. 29, 1966, 78,186; Aug. 11, 1967, 117,816
Int. Cl. B29f *3/00, 21/54*
U.S. Cl. 264—177 **4 Claims**



The invention discloses a spinneret for producing a trilobal filament, and filaments produced using such spinneret. The shape of each orifice of the spinneret can be considered as being produced by a circular aperture, diameter D into which project at 120° intervals, three identical triangular portions, sides of the triangles being tangent to one or more coaxial circles having a diameter between ⅙ and ⅓ of D, the angle at the apex of each triangle being between 60 and 100°.

3,579,626
METHOD FOR CURING TIRES AND THE LIKE
Glenn B. Brittain, Amiens, France, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Oct. 30, 1968, Ser. No. 771,757
Int. Cl. B29h *5/01, 5/02*
U.S. Cl. 264—297 **19 Claims**



A method for curing tires in a bladder-equipped press. During the main heating period, the bladder is filled first with steam to conform the tire and bladder to the mold and to begin the cure of the tire. The steam is then replaced with water at a high pressure and at a temperature approximately equal to the maximum permissible vulcanizing temperature so as to maintain the tire against the mold and to continue the cure. In the final phase of the main heating period, steam at a high pressure at least equal to the vapor pressure of the water is utilized to force the water, without vaporization, from the bladder without interruption of the curing operation. The remaining steam is then vented to the atmosphere. In this manner, the water used to cure the tire can be reused without a change of state and the bladder is maintained at a high temperature for subsequent curing cycles.

3,579,627
RH_0 BLOOD TESTING SERUM
Zenro Hayakawa, Matsumoto, Japan, assignor to Takeda Chemical Industries, Ltd., Osaka, Japan
No Drawing. Filed Sept. 29, 1967, Ser. No. 671,550
Claims priority, application Japan, Sept. 29, 1966, 41/64,581
Int. Cl. G01n *33/16*
U.S. Cl. 424—11 **2 Claims**

Rh_0 testing serum comprises anti-Rh_0 incomplete antibody of human origin and anti-Rh_0 complete antibody of animal origin, the Coombs titre and the agglutinin titres being at least about 32 and about 16, respectively, the ratio of Coombs titre to agglutinin titre being from about 1:2 to about 8:1.

3,579,628
DRESSING FILM
Robert J. Gander, Whitehouse, and David T. Rovee, Hopewell, N.J., assignors to Johnson & Johnson
No Drawing. Filed July 3, 1967, Ser. No. 650,599
Int. Cl. A61l *15/00, 15/01, 15/03*
U.S. Cl. 424—28 **11 Claims**

Dressings having a hydrophilic acrylic film component adapted to contact a wound surface are prepared in which the wound contacting film is insoluble in body fluids but has a substantial affinity for water. Moisture absorbed by the film acts to plasticize the film and provide a moist, flexible, conforming surface to the underlying wound tissue. The dressing may consist of a single piece of the hydrophilic acrylic film or the film may form a part of a composite dressing wherein the wound contacting surface of the dressing is formed of a hydrophilic acrylic film. The hydrophilic acrylic films are particularly suitable for use as occlusive dressings and for controlling the proliferation of bacteria where the same have, dispersed therethrough, compositions which react with water to generate a bacteriostatic substance. Where the film base is a hydrophilic acrylic the effectiveness of the presence of the bacteriostat-generating materials, when present, is appreciably increased while any chance of tissue irritation is substantially reduced.

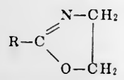
3,579,629
SALTS OF COPOLYMERS OF VINYL ACETATE/CROTONIC ACID/VINYLIC OR ALLYLIC OR METHALLYIC ESTERS IN HAIR COSMETICS
Regine Pasero, nee Perruche, and Andre Viout, Paris, France, assignors to Societe Anonyme dite: L'Oreal
No Drawing. Filed July 25, 1967, Ser. No. 655,770
Claims priority, application France, Aug. 3, 1966, 71,998
Int. Cl. A61k *7/06*
U.S. Cl. 424—47 **7 Claims**

Compositions containing copolymers for use as hair dressing preparations. The copolymers consist of vinyl acetate, crotonic acid and either a vinylic ester, allylic ester or methallylic ester.

3,579,630
TREATING THE HAIR WITH OXAZOLINE POLYMER AND COPOLYMER HAIR DRESSING FORMULATIONS
Jack L. Herz, Parsippany, Alan J. Levy and Morton H. Litt, Morristown, and Joseph L. Zuckerman, Livingston, N.J., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed Dec. 29, 1966, Ser. No. 605,590
Int. Cl. A61k *7/06*
U.S. Cl. 424—47 **9 Claims**

An improved hair dressing formulation containing (a) from about 0.1 to about 10 weight percent of a water-

dispersible polymer having a reduced viscosity ranging from about 0.5 to about 5.0 as determined on a 0.52 weight percent solution of polymer in meta-cresol at 25° C., said polymer being selected from the group consisting of homopolymers and copolymers of monomers of the formula:



wherein R is a substituent selected from the group consisting of

$$CH_3-,\ C_2H_5-,\ C_nH_{2n+1}\overset{O}{\overset{\|}{C}}-O-(CH_2)_m-,\ C_nH_{2n+1}O\overset{O}{\overset{\|}{C}}-(CH_2)_m-$$

wherein the sum of the integers m and n is not greater than 6, and

$$CN(CH_2)_k-,\ \text{and}\ (CH_2)_2N\overset{O}{\overset{\|}{C}}(CH_2)_k-$$

wherein k is 0 to 3; and (b) a carrier for said polymer selected from the group consisting of water, ethanol, isopropanol, and mixtures thereof.

3,579,631

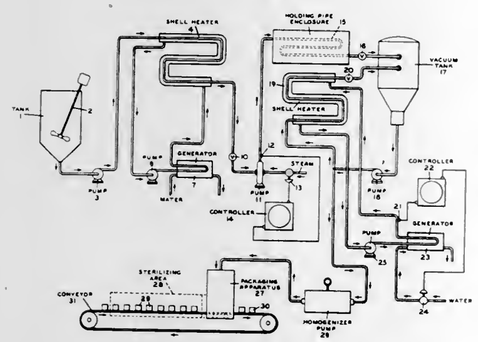
STERILIZATION OF MATERIALS CONTAINING PROTEIN

Aubrey P. Stewart, Jr., 801 Grove Ave.; Clarence R. Dreier, Jr., 1101 Nodaway St.; and Jim C. Gregory, 17th and Grove St., all of Corning, Iowa 50841

Filed May 21, 1968, Ser. No. 730,854

Int. Cl. A61k *23/02*

U.S. Cl. 424—86 **5 Claims**



A process for sterilizing heat-sensitive materials in which the protein coagulates at high temperature, said process including dilution of the material followed by high temperature short time sterilization thereof, without said protein coagulating.

3,579,632

HAIR AND SCALP TREATMENT WITH A PRINCIPALLY SODIUM CHLORIDE THICK VISCOUS AQUEOUS SLURRY

Victor G. Sonnen, Broad Brook Road, Hazardville, Conn. 06036

No Drawing. Filed Aug. 2, 1965, Ser. No. 476,640

Int. Cl. A61k *7/06*

U.S. Cl. 424—70 **14 Claims**

A hair conditioner composition, useful in reducing the drying time of the hair after washing and causing the hair to become more manageable, and also having dandruff alleviating properties, is provided comprising 30–76 parts by weight of a salt of at least 60% NaCl having a particle size preferably in the range of 0.00025 to 0.00125 inch and 70–24 parts by weight of water. The composition may also include thickening agents, a fatty alcohol, detergent, lanolinic material, perfume and dye.

3,579,633

MULTIPLE CLOSTERIDIAL ANTIGEN VACCINE FOR ANIMALS

Robert Orrock Thomson, London, England, assignor to Burroughs Wellcome & Co. (U.S.A.) Inc., Tuckahoe, N.Y.

No Drawing. Continuation of application Ser. No. 536,606, Mar. 23, 1966. This application Jan. 14, 1969, Ser. No. 791,186

Claims priority, application Great Britain, Mar. 25, 1965, 12,726/65

Int. Cl. A61k *23/00;* **C12k** *5/00*

U.S. Cl. 424—92 **12 Claims**

An injectable vaccine preparation comprising aqueous antigenic material derived from at least two pathogenic costridium species, a mineral oil, lipophilic emulsifier and a hydrophilic emulsifier, the preparation being a stable, parenterally acceptable emulsion of an aqueous antigenic phase dispersed in a continuous oil phase, wherein the aqueous phase comprises from 10 to 35% of the volume of the preparation.

3,579,634

NOVEL ANTACID COMPOSITIONS AND METHODS FOR THEIR ADMINISTRATION

Garland Richard Brown, 5522 W. Hamilton Road, Fort Wayne, Ind. 46809

No Drawing. Continuation-in-part of application Ser. No. 785,727, Dec. 20, 1968, which is a continuation-in-part of application Ser. No. 722,176, Apr. 18, 1968. This application Apr. 14, 1970, Ser. No. 28,297

Int. Cl. A61k *27/00*

U.S. Cl. 424—154 **33 Claims**

The invention relates to a novel antacid containing as the essential ingredients an antacid and a water dispersible, colloidal anionic ether or ester derivative of a low polymer of a monosaccharide. The invention includes methods of preparation and administration of the novel antacid, as well as its formulation into liquid or solid, including compressed tablets, dosage forms.

3,579,635

ANTIBIOTIC TREATMENT OF RUMINANT ANIMALS WITH BIS-UREA ADDUCTS OF ALDEHYDE-CONTAINING MACROLIDE ANTIBIOTICS

Arthur P. Raum, New Palestine, and Richard M. Kline, Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

No Drawing. Continuation-in-part of application Ser. No. 744,627, July 15, 1968, which is a continuation-in-part of application Ser. No. 687,499, Dec. 4, 1967. This application Oct. 8, 1969, Ser. No. 864,892

Int. Cl. A61k *21/00*

U.S. Cl. 424—181 **2 Claims**

Ruminants are treated for therapeutic or growth-promoting purposes with novel bis-urea adducts of aldehyde-containing macrolide antibiotics which derivatives are antibiotically inactive though substantially chemically stable in the rumen, but which are unstable in the abomasum wherein they are converted to a macrolide antibiotic.

3,579,636

UREA SYNTHESIS PROCESS

Ivo Mavrovic, 530 E. 72nd St., New York, N.Y. 10021

Filed May 16, 1968, Ser. No. 729,764

Int. Cl. C07c *127/00*

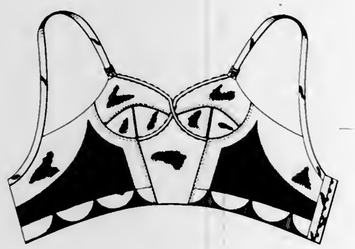
U.S. Cl. 260—555 **11 Claims**

Urea recycle process in which water content of recycled NH_3 and CO_2 is reduced and conversion in urea reactor is increased. Major portion of the heat of reaction generated from the condensation of the recycled NH_3 and CO_2 gases to form an aqueous ammonium carbamate solution is recovered in heat exchange with reactor feed streams, to produce steam in a reactor coil. Heat generated in a urea synthesis reactor is used in one or more related operating units including ammonium carbamate decomposers, thus providing an efficient process heat balance.

DESIGNS

MAY 18, 1971

220,741
BRASSIERE
Joseph P. Marcario, Saddle Brook, and Jack J. LoCascio, Bayonne, N.J., assignors to Sarong, Inc., New York, N.Y.
Filed Nov. 3, 1969, Ser. No. 19,877
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—24

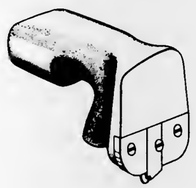


220,742
SWIM SUIT OR SIMILAR ARTICLE
Edward H. Mohl, 5716 Woodbine Ave., Philadelphia, Pa. 19131
Original design application Nov. 25, 1968, Ser. No. 14,642, now Patent No. 216,245, dated Dec. 9, 1969. Divided and this application July 24, 1969, Ser. No. 19,343
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—42

220,743
GOGGLES
Theodore C. Neward, 2066 W. 11th St., Upland, Calif. 91786
Original design application Apr. 7, 1969, Ser. No. 16,604, now Patent No. 218,547, dated Sept. 1, 1970. Divided and this application Jan. 16, 1970, Ser. No. 20,958
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—234

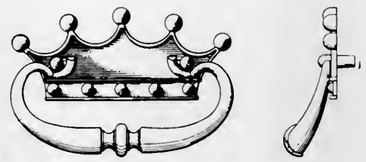
220,744
FRICTION TYPE BOTTLE CAP REMOVER
James E. Guthrie, 5917-B Woodson Road, Kansas City, Mo. 64133
Filed Sept. 2, 1969, Ser. No. 18,943
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—18

220,745
GLASS CUTTING TOOL
Stephen J. Kovacik, Rossford, Ohio, assignor to Libbey-Owens-Ford Company, Toledo, Ohio
Filed Apr. 20, 1970, Ser. No. 22,514
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—51



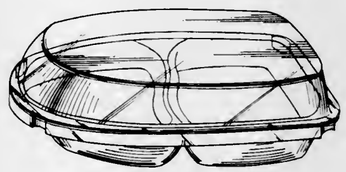
220,746
TYPE SOLDERING JIG
Robert C. Lokey, Tamal, Calif. (% Lokey Tool, Inc., 220 Juana Ave., San Leandro, Calif. 94577)
Filed Nov. 5, 1969, Ser. No. 19,961
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D8—71

220,747
STATIONARY PULL
James R. Deadrick, Winston-Salem, N.C., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed Feb. 9, 1970, Ser. No. 21,340
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—159

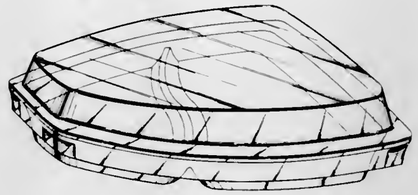


220,748
BOTTLE
Jerome Gould, Encino, Calif., assignor to Johnson & Johnson
Filed June 1, 1970, Ser. No. 23,240
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—82

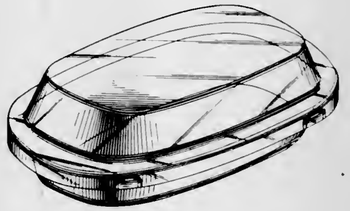
220,749
COMBINED PACKAGING TRAY AND COVER
Kenneth W. Artz, Mohnton, Pa., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 17, 1968, Ser. No. 15,018
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—185



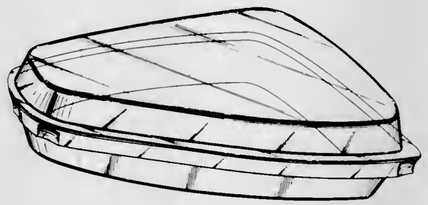
220,750
COMBINED PACKAGING TRAY AND COVER
Kenneth W. Artz, Mohnton, Pa., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 17, 1968, Ser. No. 15,021
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—185



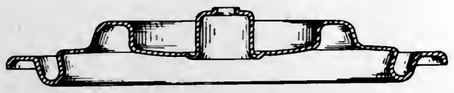
220,751
COMBINED PACKAGING TRAY AND COVER
Kenneth W. Artz, Mohnton, Pa., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 17, 1968, Ser. No. 15,022
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—219



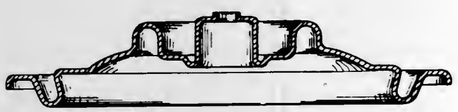
220,752
COMBINED PACKAGING TRAY AND COVER
Kenneth W. Artz, Mohnton, Pa., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Dec. 17, 1968, Ser. No. 15,023
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—219



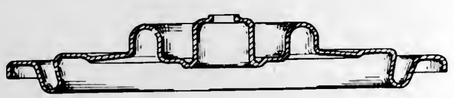
220,753
CONTAINER END
Arthur P. Zundel, 5959 S. Cicero Ave., Cary, Ill. 60638
Filed Jan. 26, 1970, Ser. No. 21,080
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—253



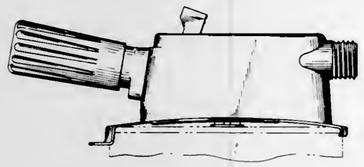
220,754
CONTAINER END
Arthur P. Zundel, 5959 S. Cicero Ave., Cary, Ill. 60638
Filed Jan. 26, 1970, Ser. No. 21,081
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—253



220,755
CONTAINER END
Arthur P. Zundel, 5959 S. Cicero Ave., Cary, Ill. 60638
Filed Jan. 26, 1970, Ser. No. 21,093
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—253

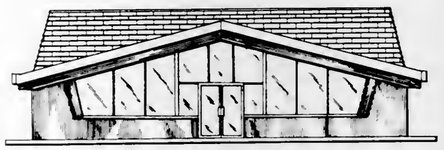


220,756
UNIT FOR DISPENSING LIQUID FROM A CONTAINER
Richard D. Zenger, 2745 College Ave., Downers Grove, Ill. 60515, and Raymond M. Traczyk, 5428 S. Sayre, Chicago, Ill. 60638
Continuation-in-part of design application Ser. No. 10,963, Mar. 13, 1968. This application Sept. 22, 1969, Ser. No. 19,490
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D9—290

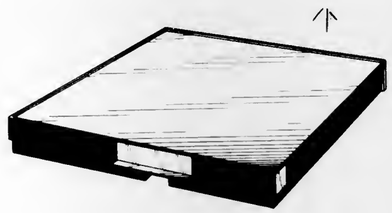


220,757
BOTTOM RAIL FOR A ROLL-TYPE DOOR
Richard E. Smith, Columbus, Ohio, assignor to Kinnear Corporation, Columbus, Ohio
Filed Sept. 11, 1969, Ser. No. 19,116
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D13—1

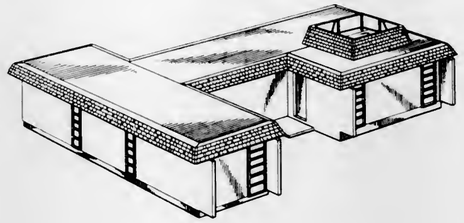
220,758
BUILDING
Donald J. Thomas, St. Louis County, Mo., assignor to Burger Chef Systems, Inc.
Filed Nov. 26, 1969, Ser. No. 20,295
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



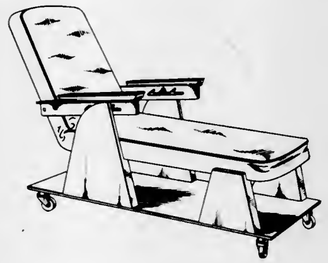
220,759
BUILDING OR THE LIKE
William C. Renwick, Barrington, Ill., assignor to Brunswick Corporation, Chicago, Ill.
Filed Apr. 8, 1970, Ser. No. 22,332
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



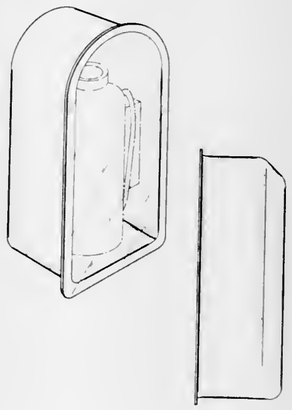
220,760
MODULAR HOME
John M. Evans, Fort Lauderdale, Fla., assignor to Behring Corporation, Fort Lauderdale, Fla.
Filed Apr. 10, 1970, Ser. No. 22,371
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



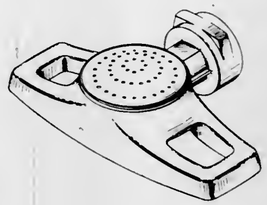
220,761
MOBILE LOUNGE CHAIR
Clarence E. Jackson, P.O. Box 1109, Texas City, Tex. 77590
Filed Dec. 19, 1969, Ser. No. 20,577
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—11



220,762
FIRE EXTINGUISHER HOUSING
Lawton M. Dial, Jr., and Louis J. Grossheim, Houston, Tex., Donald M. Schramme, Baton Rouge, La., and Walter H. Zennecker, Houston, Tex., assignors to Arthur Dooley and Son, Inc., Beaumont, Tex.
Filed Feb. 12, 1970, Ser. No. 21,411
Term of patent 14 years
Int. Cl. D29—*01*
U.S. Cl. D16—2



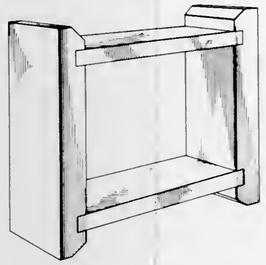
220,763
LAWN SPRINKLER
Melvin H. Best, Pasadena, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.
Filed Feb. 16, 1970, Ser. No. 21,450
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7



220,764
HOUSING FOR COMPUTER INTERFACE UNIT
Charles J. Ortega, Van Nuys, and Frederic L. Naff, Jr., Los Angeles, Calif., assignors to Computer Transmission Corporation, Los Angeles, Calif.
Filed Mar. 23, 1970, Ser. No. 22,016
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

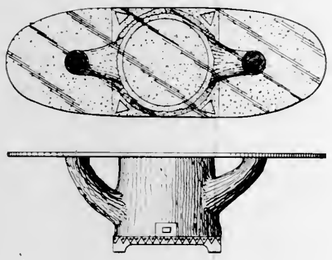
220,765
PANEL BOX FOR REFRIGERATOR CONTROL
Gus Romanias, 2611 S. Grant St., Arlington, Va. 22202, and Herman H. Gorham, 5616 Bouffant Blvd., Alexandria, Va. 22311
Filed Nov. 28, 1969, Ser. No. 20,302
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13

220,766
STANDARD FOR USE IN SUPPORTING HORIZONTAL BOOKSHELVES
Phillip E. Miller, 1861 Heatherdale Ave., San Jose, Calif. 95126
Filed July 16, 1969, Ser. No. 18,225
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D33—3

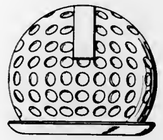


220,767
INSTRUCTION CUBICLE
Lawrence H. Power, 710 Leona Drive, Ann Arbor, Mich. 48103
Filed Jan. 6, 1970, Ser. No. 20,776
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—7

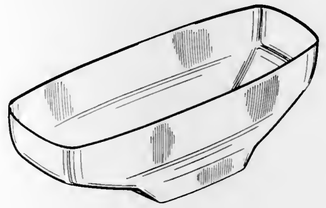
220,768
COCKTAIL TABLE
John H. Jordan, Jr., 8211 S. Maryland Ave., Chicago, Ill. 60619
Filed Aug. 29, 1969, Ser. No. 18,919
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—14



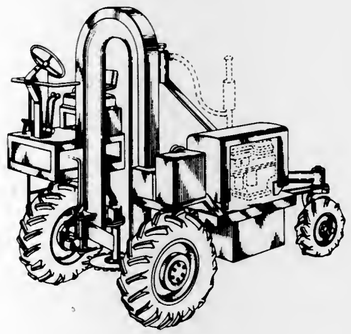
220,769
SLIDABLE GOLF BALL FOR PUTTING PRACTICE
Paul D. LaHue, 5880 N. Rural, Indianapolis, Ind. 46220
Filed Nov. 7, 1969, Ser. No. 19,986
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



220,770
PLANTER BOWL
Lynn R. Townsend, 10707 Jamacha Blvd., Space 174, Spring Valley, Calif. 92077
Filed Sept. 5, 1969, Ser. No. 19,041
Term of patent 14 years
Int. Cl. D31
U.S. Cl. D35—1



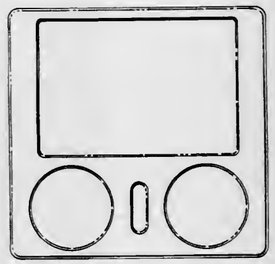
220,771
POWER TRAIN FOR SUGAR HARVESTERS
Vernon P. Broussard, P.O. Box 227, St. Martinville, La. 70582
Continuation-in-part of abandoned design application Ser. No. 11,429, Apr. 12, 1968. This application Dec. 18, 1969, Ser. No. 20,558
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D40—1



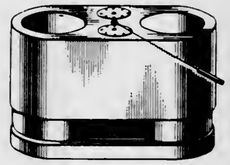
220,772
PULLER
Harold V. Hawkins, 4985 Meadowbrook Road; and Ralph A. Dick, 8667 Bonview, both of Williamsville, N.Y. 14221; and John Wendel, 42 Susan Lane, Cheektowaga, N.Y. 14225
Filed Feb. 5, 1970, Ser. No. 21,286
Term of patent 14 years
Int. Cl. D8—*02*
U.S. Cl. D41—1

220,773
COVERED BEVERAGE PITCHER
Richard D. Dilyard, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Feb. 16, 1970, Ser. No. 21,558
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—1

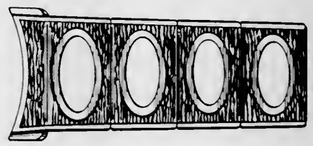
220,774
FOOD SERVICE TRAY
Harford E. Goings, 5428 Center Drive, Camp Springs, Md. 20031
Filed Oct. 10, 1969, Ser. No. 19,496
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—10



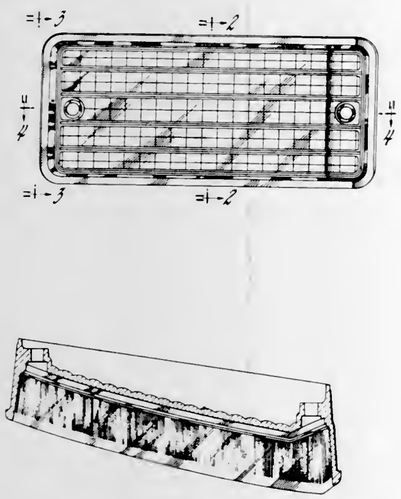
220,775
COMBINED EGG HOLDER AND OPENER, CONDIMENT DISPENSERS AND HOLDER THEREFOR AND SPOON HOLDER
Frank D. O'Neill, 94 Willcocks St. W., Toronto, Ontario, Canada
Filed Feb. 10, 1970, Ser. No. 21,392
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D44—24



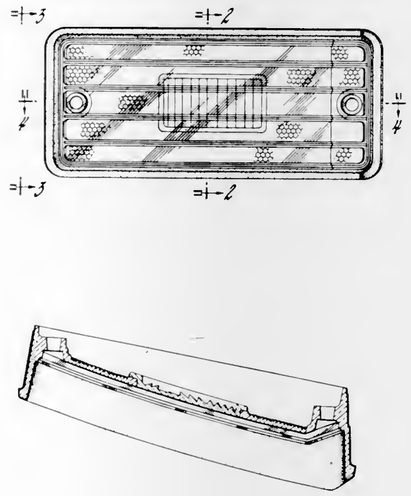
220,776
EXPANSIBLE END LINK FOR A BRACELET OR SIMILAR ARTICLE
Murray L. Cowan, Norwood, Mass., assignor to Textron Inc., Providence, R.I.
Filed May 5, 1970, Ser. No. 22,815
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D45—4



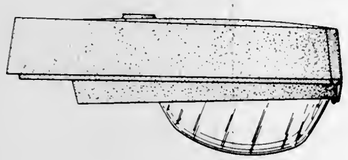
220,777
MOTOR VEHICLE LAMP LENS
Philip Garcia, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 26, 1970, Ser. No. 21,067
Term of patent 7 years
Int. Cl. D12—*99*
U.S. Cl. D48—32



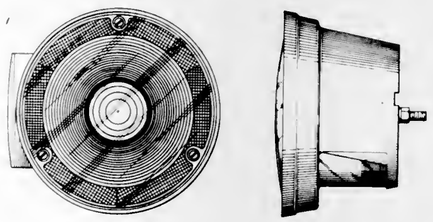
220,779
MOTOR VEHICLE LAMP LENS
Philip Garcia, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 26, 1970, Ser. No. 21,089
Term of patent 7 years
Int. Cl. D12—*99*
U.S. Cl. D48—32



220,778
LUMINAIRE
Edward R. Jablonski, South Milwaukee, Wis., and Giacinto C. D'Ercoli, Part Forest, Ill., assignors to McGraw-Edison Company, South Milwaukee, Wis.
Filed Jan. 26, 1970, Ser. No. 21,083
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D48—31

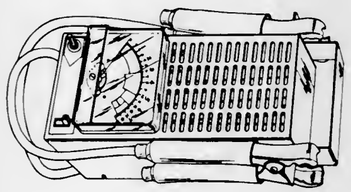


220,780
AUTOMOTIVE LAMP
Charles J. Newman, Madison, Ind., assignor to The Grote Manufacturing Company, Madison, Ind.
Filed Apr. 27, 1970, Ser. No. 22,685
Term of patent 14 years
Int. Cl. D12—*99*
U.S. Cl. D48—32



220,781
BALLOON VENDING MACHINE
Monte L. Levin, New York, N.Y., assignor to Miner Industries, Inc., New York, N.Y.
Filed May 14, 1970, Ser. No. 22,984
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3

220,782
PORTABLE BATTERY TESTER
Albert Mazeika, Chicago, Ill., assignor to Milton Manufacturing Company, Inc., Chicago, Ill.
Filed July 10, 1970, Ser. No. 23,894
Term of patent 14 years
Int. Cl. D10—*11*
U.S. Cl. D52—6

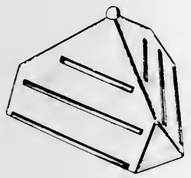


220,783
SPOON OR SIMILAR ARTICLE OF FLATWARE
Ronald A. Guodace, Tracy, Conn., assignor to International Silver Company, Meriden, Conn.
Filed June 8, 1970, Ser. No. 23,341
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

220,784
SPOON OR SIMILAR ARTICLE OF FLATWARE
Robert King, Wallingford, Conn., assignor to International Silver Company, Meriden, Conn.
Filed June 8, 1970, Ser. No. 23,382
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

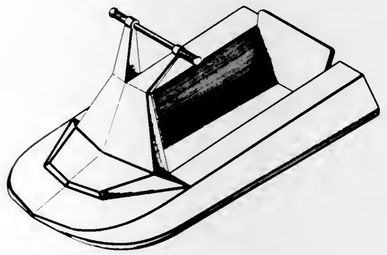
220,785
SPOON OR SIMILAR ARTICLE OF FLATWARE
Siro R. Toffolon, Meriden, Conn., assignor to International Silver Company, Meriden, Conn.
Filed June 10, 1970, Ser. No. 23,432
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D54—12

220,786
PHOTOGRAPHIC SLIDE SORTING RACK
Aaron E. Gandy, P.O. Box 741, 2613 W. Storey, Midland, Tex. 79701
Filed Apr. 22, 1970, Ser. No. 22,571
Term of patent 14 years
Int. Cl. D16—*99*
U.S. Cl. D61—1

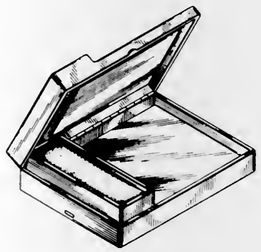


220,787
TYPEWRITER
John Svezia, Millburn, N.J., assignor to Ing. C. Olivetti & Co., S.p.A., Ivrea, Italy
Filed Feb. 24, 1970, Ser. No. 21,576
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

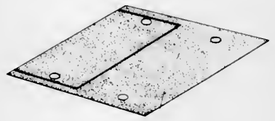
220,788
OCCUPANT-BODY-STEERABLE SELF-PROPELLABLE AQUAPLANE OR SIMILAR ARTICLE
Joe E. Piazza, Pacifica, Calif., assignor to Leisure Products Corporation, Menlo Park, Calif.
Filed Apr. 15, 1970, Ser. No. 22,450
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D71—1

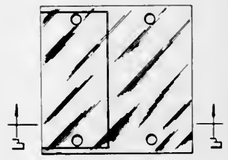


220,789
COSMETIC CASE
Klein K. Haddaway, 1650 21st Road N., Arlington, Va. 22209
Filed Aug. 8, 1969, Ser. No. 18,594
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D86—10

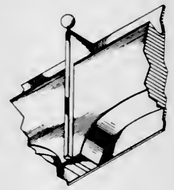


220,790
IDENTIFICATION TAG BLANK
William T. Rives, 38 Decorie Drive, Wilbraham, Mass. 01095
Filed June 16, 1969, Ser. No. 17,730
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D96—3





220,791
SIGN PANEL
Marilyn Lewis, Beverly Hills, Calif., assignor to Hamburger Hamlets, Inc.
Filed Dec. 15, 1969, Ser. No. 20,494
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 18TH DAY OF MAY, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aas, Helge: *See—*
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Abend, Irving J., to Lear Siegler, Inc. Protection circuit with simultaneous voltage and current sensing means. 3,579,042, Cl. 317-33.
Abens, Sandors G.: *See—*
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Acoustic Research, Inc.: *See—*
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Adams, Cecil E., to Abex Corporation. Fluid pump having internal rate of pressure gain limiting device. 3,578,888, Cl. 418-133.
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Affel, John J., to International Telephone and Telegraph Corporation. Decade counter or the like. 3,578,792, Cl. 235-144.
Aga, Takashi; and Yamanaka, Masami, to Yamato Scale Company, Limited. Pulse counting device with memory. 3,579,205, Cl. 340-173.
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Anderson, Robert A.; Faulkner, Alfred H.; and Hughes, Edwin L., to General Motors Corporation. Method and apparatus for fault testing a digital computer memory. 3,579,199, Cl. 340-172.5
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Craddock, John H.; Hershman, Arnold; Paulik, Frank E.; and Roth, James F., to Monsanto Company. Production of carboxylic acids. 3,579,552, Cl. 260-413.
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Erickson, Robert W., to The Regents of the University of Minnesota. Wood drying method. Re. 2,124, 5-18-71, Cl. 34—5.
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Dilyard, Richard D., to Rubbermaid Incorporated. Covered beverage pitcher. 220,773, 5-18-71, Cl. D44—1.
Dooley, Arthur, and Son, Inc.: *See*—
Dial, Lawton M., Jr., Grossheim, Schramme, and Zennecker. 220,762.
Erkers, Arne. Handsaw. 220,677, 5-18-71, Cl. D8—96.
Evans, John M., to Behring Corporation. Modular home. 220,760, 5-18-71, Cl. D13—1.
Gandy, Aaron E. Photographic slide sorting rack. 220,786, 5-18-71, Cl. D61—1.
Garcia, Philip, to General Motors Corporation. Motor vehicle lamp lens. 220,777, 5-18-71, Cl. D48—32.
Garcia, Philip, to General Motors Corporation. Motor vehicle lamp lens. 220,779, 5-18-71, Cl. D48—32.
General Motors Corporation: *See*—
Garcia, Philip. 220,777.
Garcia, Philip. 220,779.
Goings, Harford E. Food service tray. 220,774, 5-18-71. Cl. D44—10.
Gomez, Claudio G. and F. Kvapil, to The National Cash Register Company. Cash register or similar article. 220,719, 5-18-71, Cl. D52—4.
Gorham, Herman H.: *See*—
Romanias, Gus, and Gorham. 220,765.
Gould, Jerome, to Johnson & Johnson. Bottle. 220,748, 5-18-71, Cl. D9—82.
Grace, W. R., & Co.: *See*—
Artz, Kenneth W. 220,749.
Artz, Kenneth W. 220,750.
Artz, Kenneth W. 220,751.
Artz, Kenneth W. 220,752.
Grossheim, Louis J.: *See*—
Dial, Lawton M., Jr., Grossheim, Schramme, and Zennecker. 220,762.
Grote Manufacturing Company, The: *See*—
Newman, Charles J. 220,780.
Guodace, Ronald A., to International Silver Company. Spoon or similar article of flatware. 220,783, 5-18-71, Cl. D54—12.
Guthrie, James E. Friction type bottle cap remover. 220,744. 5-18-71, Cl. D8—18.
Haddaway, Klein K. Cosmetic case. 220,789, 5-18-71, Cl. D86—10.
Hamburger Hamlets, Inc.: *See*—
Lewis, Marilyn. 220,791.

Hawknis, Harold V., R. A. Dick, and J. Wendel. Puller. 220,772, 5-18-71, Cl. D41—1.
International Business Machines Corporation: *See*—
Kapper, Henry. 220,698.
International Silver Company: *See*—
Gnodace, Ronald A. 220,783.
King, Robert. 220,784.
Toffolon, Siro R. 220,785.
Jablonski, Edward R., and G. C. D'Ercoli, to McGraw-Edison Company. Luminaire. 220,778, 5-18-71, Cl. D48—31.
Jackson, Clarence E. Mobile lounge chair. 220,761, 5-18-71, D15—11.
Johnson & Johnson: *See*—
Gould, Jerome. 220,748.
Jordan, John H. Cocktail table. 220,768, 5-18-71. Cl. D33—14.
Kapper, Henry, to International Business Machines Corporation. Telephone terminal. 220,698, 5-18-71, Cl. D26—14.
King, Robert, to International Silver Company. Spoon or similar article of flatware. 220,784, 5-18-71, D54—12.
Kinnear Corporation: *See*—
Smith, Richard E. 220,757.
Kovacik, Stephen J., to Libbey-Owens-Ford Company. Glass cutting tool. 220,745, 5-18-71, Cl. D8—51.
Kvapil, Francesco: *See*—
Gomez, Claudio G. and Kvapil. 220,719.
LaHue, Paul D. Slidable golf ball for putting practice. 220,769, 5-18-71, Cl. D34—5.
Larson, Roger V., to Bio-Logics, Inc. Information plate for a hospital patient. 220,740, 5-18-71, Cl. D96—13.
Leisure Products Corporation: *See*—
Piazza, Joe E. 220,788.
Levin, Monte L., to Miner Industries, Inc. Balloon vending machine. 220,781, 5-18-71, Cl. D52—3.
Lewis, Marilyn, to Hamburger Hamlets, Inc. Sign panel. 220,791, 5-18-71, Cl. D96—12.
Libbey-Owens-Ford Company: *See*—
Kovacik, Stephen J. 220,745.
Lo Cascio, Jack J.: *See*—
Marcario, Joseph P., and Lo Cascio. 220,741.
Lokey, Robert C. Type soldering jig. 220,746, 5-18-71, Cl. D8—71.
Marcario, Joseph P., and J. J. Lo Cascio, to Sarong, Inc. Brassiere. 220,741, 5-18-71, Cl. D2—24.
Mazeika, Albert, to Milton Manufacturing Company, Inc. Portable battery tester. 220,782, 5-18-71, Cl. D52—6.
McGraw-Edison Company: *See*—
Jablonski, Edward R., and D'Ercoli. 220,778.
Miller, Phillip E. Standard for use in supporting horizontal bookshelves. 220,766, 5-18-71, Cl. D33—3.
Milton Manufacturing Company, Inc.: *See*—
Mazeika, Albert. 220,782.
Miner Industries, Inc.: *See*—
Levin, Monte L. 220,781.
Mohl, Edward H. Swim suit or similar article. 220,742, 5-18-71, Cl. D2—42.
Naff, Frederic L., Jr.: *See*—
Ortega, Charles J., and Naff. 220,764.
National Cash Register Company, The: *See*—
Gomez, Claudio G., and Kvapil. 220,719.
Neward, Theodore C. Goggles. 220,743, 5-18-71, Cl. D2—234.
Newman, Charles J., to The Grote Manufacturing Company. Automotive lamp. 220,780, 5-18-71, Cl. D48—32
Nield, Refsgaard, to Dansk Designs, Ltd. Cup. 220,712, 5-18-71, Cl. D44—9.
Olivetti, Ing. C., & Co., S.p.A.: *See*—
Svezia, John. 220,787.
O'Neill, Frank D. Combined egg holder and opener, condiment dispensers and holder therefor and spoon holder. 220,775 5-18-71, Cl. D44—24
Ortega, Charles J., and F. L. Naff, Jr., to Computer Transmission Corporation. Housing for computer interface unit. 220,764, 5-18-71, Cl. D26—5.
Pallet, David M. Coin-holder and dispenser. 220,718, 5-18-71, Cl. D52—4.
Piazza, Joe E., to Leisure Products Corporation. Occupant-body-steerable self-propellable aquaplane or similar article. 220,788, 5-18-71, Cl. D71—1.
Power, Lawrence H. Instruction cubicle. 220,767, 5-18-71, Cl. D33—7.
Quistgaard, Jens H., to Dansk Designs, Ltd. Candelabra. 220,713, 5-18-71, Cl. D48—2.
Rain Bird Sprinkler Mfg. Corporation: *See*—
Best, Melvin H. 220,763.
Reid, Essie M. Combined cabinet and accessory tray unit. 220,706, 5-18-71, Cl. D33—19.
Renwick, William C., to Brunswick Corporation. Building or the like. 220,759, 5-18-71, Cl. D13—1.
Rives, William T. Identification tag blank. 220,790, 5-18-71, Cl. D96—3.
Romanias, Gus, and H. H. Gorham. Panel box for refrigerator control. 220,765, 5-18-71, Cl. D26—13.
Rubbermaid Incorporated: *See*—
Dilyard, Richard D. 220,773.
Sarong, Inc.: *See*—
Marcario, Joseph P., and Lo Cascio. 220,741.
Schramme, Donald M.: *See*—
Dial, Lawton M., Jr., Grossheim, Schramme, and Zennecker. 220,762.
Smith, Richard E., to Kinnear Corporation. Bottom rail for a roll-type door. 220,757, 5-18-71, Cl. D13—1.
Stewart-Warner Corporation: *See*—
Deadrick, James R. 220,747.
Stineman, James S. Air-supported structure. 220,685, 5-18-71, Cl. D13—1.
Stineman, James S. Air-supported structure. 220,686, 5-18-71, Cl. D13—1.
Svezia, John, to Ing. C. Olivetti & Co., S.p.A. Typewriter. 220,787, 5-18-71, Cl. D64—11.
Textron Inc.: *See*—
Cowan, Murray L. 220,776.
Thomas, Donald J., to Burger Chef Systems, Inc. Building. 220,758, 5-18-71, Cl. D13—1.
Toffolon, Siro R., to International Silver Company. Spoon or similar article of flatware. 220,785, 5-18-71, Cl. D54—12.
Townsend, Lynn R. Planter bowl. 220,770, 5-18-71, Cl. D35—1.
Traczyk, Raymond M.: *See*—
Zenger, Richard D., and Traczyk. 220,756.
Wendel, John: *See*—
Hawkins, Harold V., Dick, and Wendel. 220,772.
Zenger, Richard D., and R. M. Traczyk. Unit for dispensing liquid from a container. 220,756, 5-18-71, Cl. D9—290.
Zennecker, Walter H.: *See*—
Dial, Lawton M., Jr., Grossheim, Schramme, and Zennecker. 220,762.
Zundel, Arthur P. Container end. 220,753, 5-18-71, Cl. D9—253.
Zundel, Arthur P. Container end. 220,754, 5-18-71, Cl. D9—253.
Zundel, Arthur P. Container end. 220,755, 5-18-71, Cl. D9—253.

CLASSIFICATION OF PATENTS

ISSUED MAY 18, 1971

NOTE.—First number, class; second number, subclass; third number, patent number

2–181	3,578,736
4–166	3,578,737
8– 37	3,579,286
108	3,579,287
116.2	3,579,288
.3	3,579,289
13– 16	3,578,893
15–215	3,578,738
18– 8	3,578,739
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33–174	3,578,746
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184	3,578,747
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165	3,578,868
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39 : RE.27,123
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3,579,080
3,579,169
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56 : 3,579,211

Design Patents

6 : 220,743
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9 : 220,783
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17 : 220,759
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24 : 220,774
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26 : 220,767
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29 : 220,744
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34 : 220,741
36 : 220,772
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37 : 220,747
39 : 220,745
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42 : 220,742
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42 : 220,751
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48 : 220,761
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51 : 220,765
220,789
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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

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PATENT OFFICE NOTICES

Deposit of Microorganisms

Some inventions which are the subject of patent applications depend on the use of microorganisms which must be described in the specification in accordance with 35 U.S.C. 112. No problem exists when the microorganisms used are known and readily available to the public. When the invention depends on the use of a microorganism which is not so known and readily available, applicants must take additional steps to comply with the requirements of Section 112.

In re Argoudelis et al., 168 USPQ 99 (CCPA, 1970), accepted a procedure for meeting the requirements of 35 U.S.C. 112. Accordingly, the Patent Office will accept the following as complying with the requirements of Section 112 for an adequate disclosure of the microorganism required to carry out the invention:

(1) The applicant, no later than the effective U.S. filing date of the application, has made a deposit of a culture of the microorganism in a depository affording permanence of the deposit and ready accessibility thereto by the public if a patent is granted, under conditions which assure (*a*) that access to the culture will be available during pendency of the patent application to one determined by the Commissioner to be entitled thereto under Rule 14 of the Rules of Practice in Patent Cases and 35 U.S.C. 122, and (*b*) that all restrictions on the availability to the public of the culture so deposited will be irrevocably removed upon the granting of the patent;

(2) Such deposit is referred to in the body of the specification as filed and is identified by deposit number, name and address of the depository, and the taxonomic description to the extent available is included in the specification; and

(3) The applicant or his assigns has provided assurance of permanent availability of the culture to the public through a depository meeting the requirements of (1). Such assurance may be in the form of an averment under oath or by declaration by the applicant to this effect.

A copy of the applicant's contract with the depository may be required by the Examiner to be made of record as evidence of making the culture available under the conditions stated above.

RICHARD A. WAHL,
Assistant Commissioner.

Apr. 29, 1971.

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,611,813, Sharpless and Eichert, Jr. MAGNETIC DATA STORAGE SYSTEM, **filed** Nov. 20, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c2916, *Technitrol, Inc.* v. *Digital Equipment Corporation.*

2,706,236, Stepath, Krumm and Ross, CUTTING AND GOUGING ELECTRODE HOLDER AND METHOD, **filed** Dec. 14, 1970, D.C., N.D. Tex (Dallas), Doc. CA-3-4362-D, *Arcain* v. *James T. Jeter, Jr., doing business as J.W. Mfg. Co. and Automation Engineering & Mfg. Co.*

2,734,226, W. H. Willert, INJECTION MOLDING APPARATUS, **filed** Nov. 23, 1970, D.C. Conn. (New Haven), Doc. 14149, *Egan Machinery Company and William H. Willert* v. *Polymer Machinery Corp.*

2,742,327, T. Marks, FULLY AUTOMATIC MACHINE FOR MAKING BRUSHES, **filed** Jan. 12, 1971, D.C., S.D.N.Y., Doc. 71-C-152, *American Technical Industries, Inc.* v. *Poloron Products Inc.*

2,786,741, Huebler and Beggs, METALLURGICAL GAS GENERATOR, **filed** Dec. 14, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c3119, *Sunbeam Equipment Corp.* v. *Midland Ross Corp.*

2,824,315, G. D. McKenny, RELEASABLE COUPLING DEVICE, **filed** July 28, 1967, D.C., W.D. Wash. (Seattle), Doc. 7294, *C. J. Hendry Company* v. *Manolides, Inc.* Dismissed, Jan. 29, 1970.

2,904,449, S. W. Bradstreet, METHOD AND COMPOSITIONS FOR FLAME SPRAYING, **filed** July 17, 1968, D.C., N.D. Ill. (Chicago), Doc. 68c1320, *Continental Coatings Corp.* v. *Metco, Inc. et al.* Motion for summary judgment granted to defendants in part and complaint and counterclaim are dismissed, Jan. 22, 1971.

3,036,642, O. D. Twist, FAN; **D. 187,272**, same, **filed** Dec. 22, 1970, D.C., W.D. Wash. (Tacoma), Doc. 4220, *Flex-A-Lite Corporation* v. *Hurricane Automotive Products.*

3,205,708, J. H. Andresen, Jr., COMBINED AIRSPEED AND MACH INDICATOR; **3,435,675**, E. P. Knapp, MAXIMUM ALLOWABLE AIRSPEED POINTER, **filed** July 4, 1970, D.C.N.J. (Newark), Doc. 891-70, *Lear Siegler, Inc.* v. *Intercontinental Dynamics Corp.* Stipulation and order of dismissal, Jan. 5, 1971.

3,210,053. (See D. 207,293.)

3,229,413, H. K. Bross, TOYS AND RACK ACTUATING MEANS THEREFOR; **3,229,543**, same, RACKS; **D. 205,459**, same, FLEXIBLE PULL STRAP FOR AN AERIAL TOY OR THE LIKE, **filed** Dec. 24, 1970, D.C.N.J. (Newark), Doc. 1728-70, *Kenner Products Company* v. *Helmut Karl Bross and Frank T. Johmann.*

3,229,543. (See 3,229,413.)

3,272,397, S. G. Bean, FEEDER OF NON-FLOWING MATERIAL, **filed** Feb. 3, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c322, *Food Packaging, Inc.* v. *U.S. Sugar Company, Inc. et al.*

3,275,316, G. V. Cleary, Jr. INSERT FOR NEWSPAPERS, **filed** Jan. 18, 1971, D.C., N.D. Ill (Chicago), Doc. 71c134, *Free Standing Stuffer, Inc.* v. *Parent's Magazine Enterprises.*

3,297,831, W. O. Stanton, MAGNETIC STEREOPHONIC PHONOGRAPH PICKUP, **filed** Jan. 5, 1971, D.C., S.D.N.Y., Doc. 71-C-31, *Pickering & Company Inc.* v. *Brooks Radio and Television Corporation.*

3,313,443, Dial, Habegger and Kays, FLOATING COVER FOR A LIQUID STORAGE RESERVOIR, **filed** Jan. 4, 1971, D.C.N.J. (Newark), Doc. 1-71, *Globe Linings, Inc. and Howard D. Webb* v. *Revere Plastics, Inc.*

3,319,872, Beckman and Beerbohm, MAILER, **filed** Jan. 12, 1971, D.C., W.D. Pa. (Pittsburgh), Doc. 71-46, *2B System Corporation* v. *Accounting and Business Forms, Inc. and the County of Allegheny.*

3,324,954, W. J. Westendorf, LOADER DEVICE AND METHOD OF MOUNTING SAME ON TRACTOR, **filed** Dec. 23, 1970, D.C., N.D. Iowa (Sioux City), Doc. 70-C-3061-W, *Walter J. Westendorf* v. *Sioux Steel Company.*

3,435,675. (See 3,205,708.)

3,445,324, Curler and Lineburg, FLEXIBLE WRAPPING MATERIAL, **filed** Jan. 8, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c53, *Curwood, Inc.* v. *Standard Packaging Corporation.*

3,446,892, D. M. Stout, IMMOBILIZING INSETS BY SUDDEN REDUCTION OF BODY TEMPERATURE, **filed** Feb. 1, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c286, *Whitmore Research Laboratories, Inc.* v. *Chase Products Co., Universal Safety Equipment Co.*

3,450,212, A. G. Sylvester, MULTIPLE TOOTH SUBSOIL PLOW, **filed** Jan. 11, 1971, D.C., N.D. Tex (Lubbock), Doc. CA-5-866, *Cline Industries, Inc.* v. *Sam Stevens, Inc.*

3,464,424, F. D. Buzzelli, METHOD FOR RETAINING HAIR, **filed** Jan. 12, 1971, D.C., E.D. Mich. (Detroit), Doc. 35919, *Frank Buzzelli* v. *Minnesota Mining & Mfg. Co.*

3,486,127, Back and Garelick, INSTRUMENTATION CIRCUIT WITH D-C AMPLIFIER HAVING TEMPERATURE STABILIZATION, **filed** Dec. 29, 1970, D.C., N.D. Ohio (Cleveland), Doc. C 70-1199, *Acromag, Incorporated* v. *Transmation, Inc.*

3,494,056, B. J. Elzer, DISPLAY DEVICE, **filed** Dec. 23, 1970, D.C., N.D. Ill. (Chicago), Doc. 70c3216, *Grafika Commercial Arts Inc.* v. *Parisian Novelty Co. Inc. and Joseph Mfg. Co.*

3,498,485, B. L. Godbersen, BOOM AND FORK LIFT APARATUS, **filed** Oct. 29, 1970, D.C., N.D. Ind. (South Bend), Doc. 70-S-153, *Midwest Industries, Inc.* v. *Freeman Industries Corporation.* Dismissed upon plaintiff's motion without prejudice, Nov. 17, 1970.

3,515,087, R. S. Stuart, PLANING BOAT, **filed** Jan. 4, 1971, D.C., S.D. Fla. (Miami), Doc. 71-5-C-WM, *Penn Yan Boats, Inc.* v. *Sea Lark Boats, Inc. et al.*

Re. 24,017, J. A. Henricks, METHOD OF COATING AND DRAWING METAL AND COMPOSITION THEREFOR, **filed** July 21, 1965, D.C. Del. (Wilmington), Doc. 3058, *Devex Corporation et al.* v. *General Motors Corporation.* (Transferred from Northern District of Illinois, E.D.) Final judgment, defendant has not infringed claim 4 of the patent. The amended complaint is dismissed with prejudice, Jan. 13, 1971.

Re. 24,730, C. E. Reeves, PORTABLE SIGNALLING DEVICE, **filed** Dec. 28, 1970, D.C., N.J. (Newark), Doc. 1732-70, *Falcon Safety Products, Inc.* v. *Wagner Electric Sales Corp.*

Re. 24,899, B. K. Green, OIL-CONTAINING MICROSCOPIC CAPSULES AND METHOD OF MAKING THEM, **filed** Apr. 18, 1968, D.C. Del. (Wilmington), Doc. 3518, *The National Cash Register Company* v. *Minnesota Mining & Manufacturing Company, Inc., and Charles Pfizer & Co., Inc. (Coty Div.).* Parties reached a compromise and agreement, therefore, it is ordered adjudged and decreed as follows: Action dismissed without prejudice, Jan. 7, 1971.

D. 187,272. (See 3,036,642.)

D. 205,459. (See 3,229,413.)

D. 207,293, C. W. Ferm, SEWAGE SEPTIC TANK; **D.207,-294**, same, SEWAGE SEPTIC TANK; **3,210,053**, C. F. Boester, AERATOR STRUCTURE, **filed** Jan. 13, 1971, D.C., M.D. Pa. (Scranton), Doc. C-71-23, *Cromaglass Corporation* v. *Carl Ferm, Fred R. Sechler and Plast-A-Form Corporation.*

D. 207,294. (See D. 207,293.)

Disclaimers

Re. 26,656.—*Raymond W. Guzzardo*, McHenry, Ill. CONTAINER FABRICATING AND ORIENTING APPARATUS. Patent dated Sept. 2, 1969. Disclaimer filed Sept. 17, 1970, by the assignee, *E. M. Melahn, doing business as Northern Illinois Machine Company.*

Hereby enters this disclaimer to claims 1 to 20, inclusive, of said patent.

Re. 26,969.—*Patrick J. O'Shea*, Hazel Crest, Ill. METAL CASTING PROCESS. Patent dated Oct. 20, 1970. Disclaimer filed Jan. 11, 1971, by the assignee, *Nalco Chemical Company.*

Hereby enters this disclaimer to claim 14 of said patent.

3,364,260.—*Saul L. Neidleman*, Highland Park, N.J. 4N-DEMETHYL-4N-ETHYL TETRACYCLINES. Patent dated Jan. 16, 1968. Disclaimer filed Sept. 14, 1970, by the assignee, *E. R. Squibb & Sons, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,401,866.—*Everett C. Johnson*, North Riverside, and *Donald G. Meier*, Tinley Park, Ill. CONTAINER WITH SELF-LOCKING LID. Patent dated Sept. 17, 1968. Disclaimer filed Dec. 21, 1970, by the assignee, *Owens-Illinois, Inc.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,422,656.—*Howard S. Orr*, Upper St. Clair Township, Allegheny County, Pa., and *Anthony D. Reinhardt*, South Holland, Ill. METHOD OF ROLLING SLABS IN PLANETARY MILL. Patent dated Jan. 21, 1969. Disclaimer filed Jan. 22, 1971, by the assignee, *United States Steel Corporation.*

Hereby enters this disclaimer to claim 1 of said patent.

3,444,134.—*Anthony C. Soldatos*, Kendall Park, N.J. PHENOLATED POLYMERS OF ISOPRENE. Patent dated May 13, 1969. Disclaimer filed Jan. 22, 1971, by the assignee, *Union Carbide Corporation.*

Hereby enters this disclaimer to claims 1 through 6 of said patent.

3,515,796.—*Roger J. Schoerner*, Carrollton, Ga. INSULATED TELEPHONE CABLE. Patent dated June 2, 1970. Disclaimer filed May 25, 1970, by the assignee, *Southwire Company.*

Hereby disclaims the terminal portion of the term of said patent subsequent to May 19, 1987.

3,533,812.—*Howard B. Cummings* and *Ralph Gibson*, New Castle, Pa. PROCESS FOR THE MANUFACTURE OF CERAMIC ARTICLES, AND PRODUCT DERIVED FROM SUCH PROCESS. Patent dated Oct. 13, 1970. Disclaimer filed Dec. 23, 1970, by the assignee, *Interpace Corporation.*

Hereby enters this disclaimer to claims 10, 24, 25 and 26 of said patent.

3,567,080.—*Mack S. Johnston*, Rolling Hills, Calif. TAPPING DEVICE FOR BEER KEGS AND THE LIKE. Patent dated Mar. 2, 1971. Disclaimer filed Sept. 29, 1970, by the assignee, *Republic Corporation.*

Hereby disclaims the terminal portion of the term of said patent subsequent to Jan. 25, 1983.

Service by Publication

Richard L. Marshall

In accordance with Rule 47 of the Rules of Practice of the United States Patent Office in Patent Cases, notice is hereby given of the filing on April 24, 1969, of an application for patent entitled "Rifled Bore Construction for a Gun Barrel," on behalf of Richard L. Marshall, whose last known address was 1342 Glenarm Place, Englewood, Colorado. The application was made in compliance with Rule 47(a) and 35 U.S.C. 116 by joint inventor Anthony A'Costa without execution by the said Richard L. Marshall. Notice of the filing directed to the above noted address has been returned undelivered.

Any action to be taken by the said Richard L. Marshall, or if he is deceased, his legal representatives or heirs, in connection with the said application must be taken within thirty days of the publication of this notice.

RICHARD A. WAHL,
Assistant Commissioner of Patents.

Certificates of Correction for the Week of May 25, 1971

Re. 27,018	3,542,809	3,553,282	3,559,348
Re. 27,059	3,543,385	3,553,425	3,559,350
3,351,164	3,543,833	3,553,573	3,559,511
3,442,962	3,543,923	3,553,964	3,559,538
3,445,181	3,544,431	3,554,041	3,559,557
3,452,301	3,545,819	3,554,698	3,559,655
3,454,401	3,546,190	3,554,993	3,559,816
3,472,933	3,546,378	3,554,996	3,559,818
3,475,564	3,546,832	3,555,038	3,559,891
3,478,469	3,548,561	3,555,271	3,560,429
3,479,258	3,548,860	3,555,864	3,560,718
3,480,523	3,548,991	3,556,063	3,560,931
3,489,696	3,549,601	3,556,142	3,561,267
3,500,966	3,549,625	3,556,159	3,561,313
3,507,872	3,549,787	3,556,218	3,561,498
3,522,034	3,549,945	3,556,230	3,561,591
3,522,160	3,550,298	3,556,508	3,561,843
3,523,078	3,550,414	3,556,637	3,562,212
3,525,733	3,550,549	3,556,669	3,562,314
3,525,958	3,550,730	3,556,795	3,562,448
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3,538,209	3,551,770	3,557,505	3,565,399
3,538,668	3,552,232	3,557,564	3,565,597
3,538,920	3,552,258	3,557,605	3,565,847
3,539,911	3,552,514	3,557,841	3,566,173
3,540,015	3,552,657	3,557,962	3,566,484
3,540,103	3,552,672	3,558,612	3,566,675
3,541,042	3,552,970	3,558,663	3,567,637
3,541,060	3,553,179	3,558,853	
3,541,172	3,553,194	3,558,922	
3,541,490	3,553,198	3,558,966	

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF MAY 4, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-02-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-02-69
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	2-10-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-03-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	10-17-69
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	8-17-70
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	12-11-69
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	3-13-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	3-03-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	1-21-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	6-03-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	3-09-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	1-02-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	2-02-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—C. F. GAREAU, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	6-08-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	1-06-70

Expiration of patents: The patents within the range of numbers indicated below expire during May 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

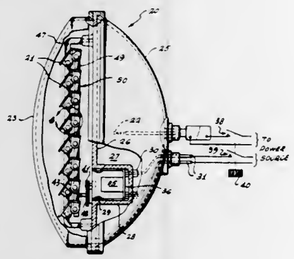
Patents..... Numbers 2,677,129 to 2,679,644, inclusive
Plant Patents..... Numbers 1,274 to 1,281, inclusive

REISSUES

MAY 25, 1971

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

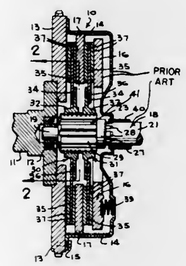
27,125
MEANS FOR REMOVING GLARE OF A LIGHT BEAM
John F. Steel, P.O. Box 401, Palm Beach, Fla. 33480
Original No. 3,333,094, dated July 25, 1967, Ser. No. 421,742, Dec. 14, 1964, which is a continuation-in-part of Ser. No. 406,973, Oct. 26, 1964. Application for reissue Jan. 21, 1969, Ser. No. 802,277
Int. Cl. F21v *11/04*
U.S. Cl. 240—46.11 **9 Claims**



A sealed-beam headlamp includes a coaxial lens and reflector, and an incandescent filament which generates a light source. A transparent plate is interposed between the filament and the lens to divide the headlamp into a hermetically sealed, evacuated filament compartment and a non-evacuated louver compartment. A frame which is fixedly mounted in the louver compartment is maintained stationary with respect to the lens and the plate. A plurality of louvers are rotatably mounted in the frame, the louvers being spaced-apart and mechanically coupled for simultaneous rotation sequentially through a fully closed position and a fully open position. A drive mechanism cooperates with the louver coupling to rotate the louvers in unison at such rate that a beam of light passing through the headlamp lens appears uninterrupted.

Alternatively, the louvers may be mounted for oscillation rather than rotation or a suitable louver coupling device may be provided to rotate adjacent louvers in opposite directions.

27,126
DUAL SPLINED SHAFT ASSEMBLY FOR A CLUTCH
Wayne P. Gingery, Harlan, Iowa, assignor to Super-Drive Products, Inc., Los Angeles, Calif.
Original No. 3,465,860, dated Sept. 9, 1969, Ser. No. 642,363, May 31, 1967. Application for reissue May 8, 1970, Ser. No. 35,835
Int. Cl. F16d *13/44, 13/58*
U.S. Cl. 192—70.13 **8 Claims**



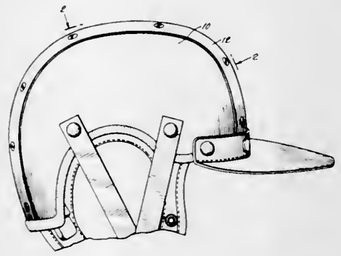
A dual splined sleeve which will protect the original shaft from damage due to high engine torque, and wherein greater lateral resistance is provided. *When the splines of the shaft become worn at their central portions, the dual splined sleeve is fitted over them so as to engage the shaft splines and extend beyond the worn portion. At least one disc member is provided with an internally splined hub and friction facing means on its outer portions, and the splined hub is fitted over the external splines of the sleeve so as to position the friction facing means for engagement by the clutch-actuating mechanism.*

PATENTS

GRANTED MAY 25, 1971

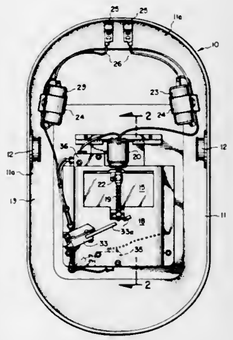
GENERAL AND MECHANICAL

3,579,637
PROTECTIVE HELMET OF ADJUSTABLE SIZE
Jackson Anthony Aileo, Carbondale, Pa., assignor to Gentex Corporation, Carbondale, Pa.
Filed Apr. 1, 1969, Ser. No. 812,073
Int. Cl. A42b *1/08*
U.S. Cl. 2—3 **10 Claims**



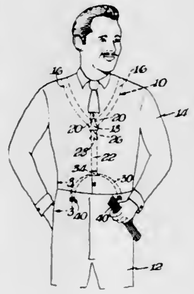
A protective helmet of adjustable size including a hollow shell adapated to receive the head of a wearer and made up of two complementary halves and a partially overlapping strip extending along their adjoining edges. The halves have, in their overlapped portions, a series of apertures elongated transversely to the strip. The strip has circular apertures aligned with the elongated apertures on the halves. Screws extend through the apertures and cooperate with nuts to hold the halves to the strip. When the screws are loosened, the halves can slide in relation to the strip over a distance limited by the length of the elongated apertures, thereby adjusting the size of the shell as required to fit the head of a particular wearer.

3,579,638
EYE-SHIELD OPERATING SYSTEM FOR WELDING HELMETS
Frank J. Davis and George Zahnor Edwards, Salt Lake City, Utah, assignors to Kedman Company, Salt Lake City, Utah
Filed Sept. 23, 1969, Ser. No. 860,210
Int. Cl. A61f *9/06*
U.S. Cl. 2—8 **9 Claims**



The eye-shield lens of a welding helmet is extended and retracted into and out of working position, respectively, by unidirectional rotation of a self-reversing worm working in a pawl attached to the lens frame. The worm is an extension of the drive shaft of a miniature electric motor powered by rechargeable batteries through circuitry arranged to provide maximum starting speed followed by reduced speed. Starting of the motor is conveniently controlled by a breath-operated switch and stopping, at the limits of lens travel, by respective limit switches. Battery recharging terminals are preferably provided as suspension hooks to engage with electric power terminals of a storage rack when the helmet is not in service.

3,579,639
SUSPENDING DEVICE FOR GARMENTS
James M. Faulkner, Laurel, Del.
(Box 231, Georgetown, Del. 19947)
Filed Nov. 8, 1968, Ser. No. 774,244
Int. Cl. A41f *3/02, 5/00*
U.S. Cl. 2—117 **4 Claims**

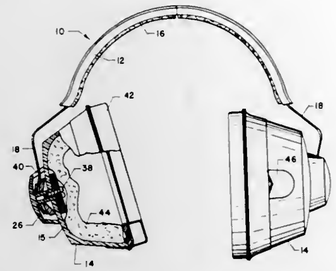


Garment suspending device comprises pair of shoulder straps with fasteners connecting ends of straps together to form loop. Pair of intermediate adjustable straps is provided with one adjustable strap secured at one end thereof to each fastener. Terminal straps are connected at their mid portions to intermediate straps, and releasable attaching structure at ends of terminal straps secure suspending device to garment of type worn below waist. Suspending device is concealed by shirt or other outer upper garment.

3,579,640
HEARING PROTECTOR HEADSETS
Fred P. Beguin, Sturbridge, and Harry Dostourian, Worcester, Mass., assignors to American Optical Corporation, Southbridge, Mass.
Filed Feb. 11, 1970, Ser. No. 10,473
Int. Cl. A42b *1/06*
U.S. Cl. 2—209 **4 Claims**

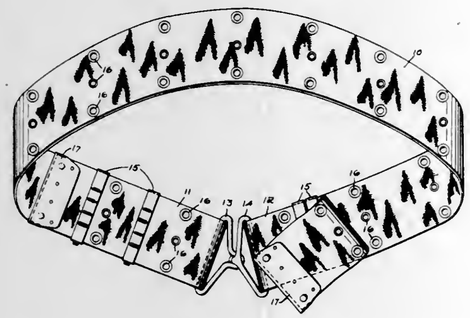
Hearing protector headsets comprising an adjustable headband, sound-attenuating earcups, and attachment and supporting means for rotatably supporting and universally slidably tilting each earcup for adjustment of headband and earcups as needed while being worn. The adjustment and supporting means for each earcup includes at each end portion of the headband a spherically-shaped aperture

formation through which parts of the attachment and supporting means extend and against the sides of which



spherically-shaped end clamping members of selected kind and shape frictionally engage.

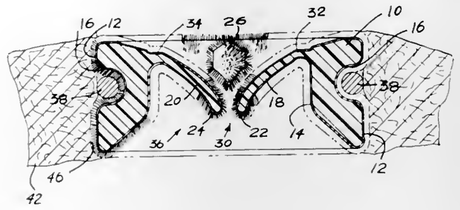
3,579,641
END CLIP FOR LOAD CARRYING BELT
Wesley S. Larson, Hazardville, Conn., assignor to the United States of America as represented by the Secretary of the Army
Filed Oct. 9, 1969, Ser. No. 864,992
Int. Cl. A41f *9/02, 19/00*
U.S. Cl. 2—325 **4 Claims**



An end clip for attachment to an end of load carrying belt to serve as means for varying the length of the belt. The end clip has prongs formed on an outer surface thereof, the prongs being releasably engagable with eyelets in the belt forming a loop in the belt of variable size which carries a portion of means for fastening the belt about the body. The end clip is preferably made of rigid plastic material with pins and openings to receive the pins formed as elements thereof during molding of the end clip, the pins serving to affix the end clip to an end of the belt.

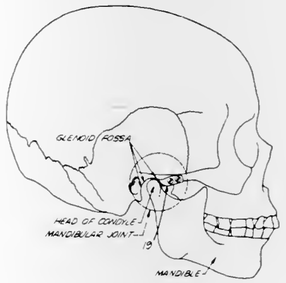
3,579,642
HEART VALVE ASSEMBLY AND METHOD OF IMPLANTING IN THE BODY
Bart T. Heffernan, 604 Laurel, Wilmette, Ill. 60091, and Efrem M. Ostrowsky, 2775 Fort Sheridan Ave., Highland Park, Ill. 60035
Filed Apr. 15, 1968, Ser. No. 721,360
Int. Cl. A61f *1/22*
U.S. Cl. 3—1 **4 Claims**

A check valve for use in a human heart or the like in which the body portion contains check valve means on the inside thereof and in which the outer wall portions contain a groove around the periphery thereof to receive a fastener in the form of a snap ring or the like. A method is described in which a membrane is opened, a stiff but resilient fastener such as a snap ring is sewn in place therein, closely adjacent the edges of the membrane which define the opening therein, and a check valve such as that described is napped into place in the opening in the mem-



brane as the ring is opened and closed over the valve, in registry with the groove. Preferably, the valve is a plastic material and the ring is stainless steel or stiff silicone rubber. The valve and method make it possible to immobilize thrombogenic materials resulting from the inclusion of a heart valve or the like in the body.

3,579,643
ARTIFICIAL ARTICULAR EMINENCE FOR THE MANDIBULAR JOINT
Douglas H. Morgan, 1700 Lila Lane, La Canada, Calif. 91011
Filed Dec. 12, 1968, Ser. No. 783,334
Int. Cl. A61f *1/24*
U.S. Cl. 3—1 **6 Claims**

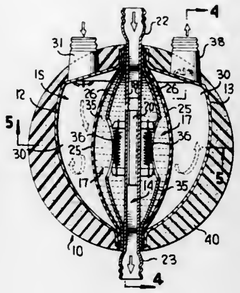


The present invention relates to the specialized field of dentistry known as oral surgery and particularly to an artificial articular eminence for the cure of disorders or dysfunctions of the mandibular joint. The artificial articular eminence of the present invention is surgically applied and provides an artificial surface for the condylar head of the mandible to contact and slide upon in opening and closing the jaw.

3,579,644
ARTIFICIAL HEART
William G. Esmond, 537 Stamford Road, Baltimore, Md. 21229
Filed Feb. 26, 1969, Ser. No. 802,580
Int. Cl. A61f *1/00*
U.S. Cl. 3—1 **8 Claims**

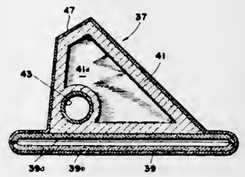
This disclosure relates to an artificial heart which is so constructed whereby it may be mounted in the human body and permanently connected to the blood vessels of that body with the heart being powered by an external

source. The heart makes use of a low boiling point liquid and a heating coil which is periodically actuated so as to effect boiling of the liquid, followed by the rapid cooling



of the liquid to condense the same whereby an expansion and contraction function is performed and constantly repeated so as to effect a pumping action.

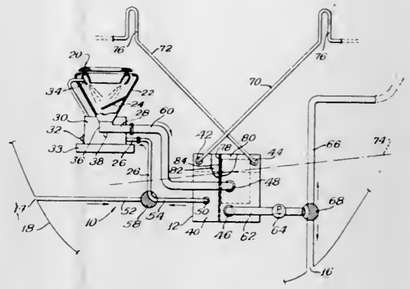
3,579,645
CARDIAC VALVE OCCLUDER HAVING A DENSITY APPROXIMATELY EQUAL TO BLOOD
Jack C. Bokros, San Diego, Calif., assignor to Gulf Energy & Environmental Systems, Inc.
Filed Apr. 30, 1969, Ser. No. 820,361
Int. Cl. A61f *1/22*
U.S. Cl. 3—1 **10 Claims**



An improved movable occluder for intermittently opening and closing the aperture in a heart valve. The occluder has an inner substrate portion and an exterior coating of a material, such as isotropic pyrolytic carbon, that is chemically nonreactive with blood. Although the exterior coating material has a density greater than blood, the substrate has an apparent density less than blood so that the composite occluder has a density that approximates blood. The substrate may be hollow or made of a porous material. An intermediate layer of low density material may be employed to deaden the sound.

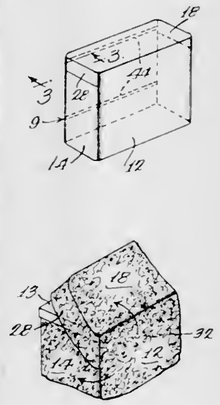
3,579,646
SHIPBOARD RECIRCULATION SEWAGE SYSTEM
Robert L. Lekberg, 4040 W. 123rd St., Alsip, Ill. 60658
Filed May 16, 1968, Ser. No. 729,774
Int. Cl. E03d *1/00;* **E03f** *5/10*
U.S. Cl. 4—10 **11 Claims**

Recirculation sewage system for shipboard use having a holding tank which enables the toilet flushing liquid to be re-cycled following removal of sizable particulate matter therefrom in the tank. The tank includes: a chamber part which receives incoming waste discharged by the toilet and in which heavier solids settle out; a longitudinal baffle screen which is self cleaning due to ship motion and which screens out other solids; and a pick up chamber



into which the screened liquid is admitted and which has a float-mounted swinging suction pipe through which only surface liquid is drawn from the tank.

3,579,647
TOILET TANK COVER
William L. Nielson, Janesville, Wis., assignor to Monterey Mills, Inc., Janesville, Wis.
Filed Feb. 11, 1969, Ser. No. 798,386
Int. Cl. B65b *11/00;* **B65d** *65/02;* **A47k** *17/00*
U.S. Cl. 4—1 **5 Claims**

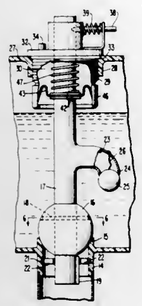


A one piece toilet tank cover wherein the top cover is integral with the side wall cover only along the front edge thereof so that the tank top may be removed easily without disturbing the side wall cover, which, at the same time, maintains a trim tailored appearance.

3,579,648
COMMODE FLUSHING MECHANISM
Walter K. Owens, P.O. Box 5641, Pensacola, Fla. 32505
Filed Sept. 9, 1968, Ser. No. 758,366
Int. Cl. E03d *1/34*
U.S. Cl. 4—52 **4 Claims**

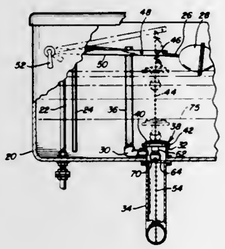
A highly compact, low cost, pressure flushing mechanism for commodes suitable for initial installations or replacement kits within existing flush tanks of the gravity type. The mechanism or plural mechanisms may also be

enclosed within a wall by virtue of its compactness. The maximum effect of city water main pressure is utilized



for flushing without the need for oversized piping or expensive flush valves.

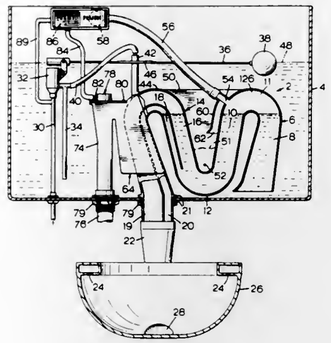
3,579,649
TOILET TANK AND GUIDE FOR FLUSH CONTROL VALVE
Arthur M. Dyer, 423 N. Graves, El Cajon, Calif. 92020
Filed Nov. 13, 1968, Ser. No. 775,313
Int. Cl. E03d *1/34*
U.S. Cl. 4—56 **7 Claims**

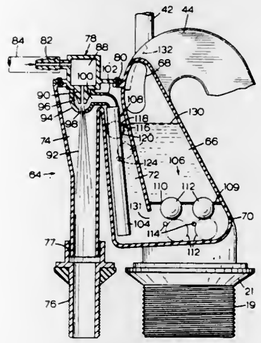


A combination of a toilet tank and a movable baffle below the flush control valve which, in conjunction with a chain extending into the drain pipe and under the influence of water being flushed, guides a float type valve toward the valve seat leading from the tank.

3,579,650
VENTING DEVICE FOR TOILETS
Frank Philip Sloan, Toronto, Ontario, Canada, assignor to Aquair Corporation Limited, Nassau, Bahamas
Filed Mar. 11, 1969, Ser. No. 806,164
Int. Cl. E03d *9/04*
U.S. Cl. 4—72 **11 Claims**

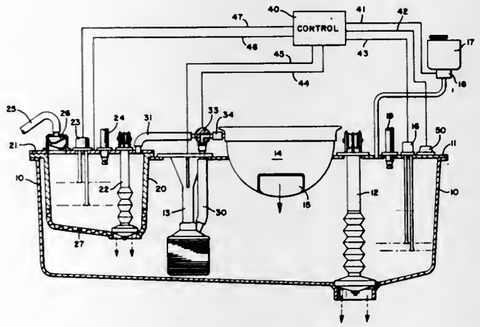
A device for sucking bathroom air through the rim holes of a toilet and for venting such air to a sewer. The device has a water trap preventing odor travel from the sewer to the room, an aspirator to empty the trap during use to permit air flow, and an inlet leg connected to the toilet flushing conduits at a location to be refilled by water flowing to the bowl during a flush, so that the trap can be refilled even if mains water pressure fails during venting. A check valve in the venting device prevent water trap emptying during air pressure fluctuations. In an alternative embodiment, venting is through an odor





removing filter which also serves to collect spray water from the aspirator and to muffle aspirator noise.

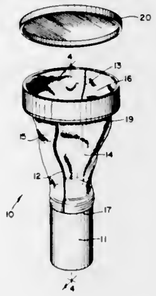
3,579,651
SELF-CONTAINED SEWERAGE SYSTEM
Ronald D. Russo, Wethersfield, Conn., assignor to Koehler-Dayton, Inc., Dayton, Ohio
Filed Nov. 28, 1969, Ser. No. 880,725
Int. Cl. E03d *7/00;* **B01d** *33/02*
U.S. Cl. 4—78 **11 Claims**



In a self-contained sewerage system of the type in which the sewage is accumulated and stored within the system and recirculated for flushing, when the level of liquid and

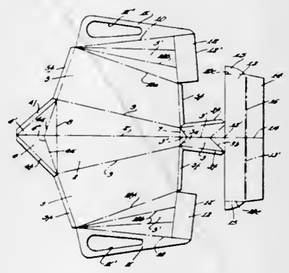
solid wastes within the collection tank reaches a preset level, the liquid wastes are withdrawn from the tank and pumped to an evaporative still where they are evaporated and vented from the system.

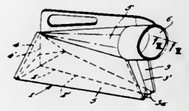
3,579,652
SANITARY URINE COLLECTOR
Richard E. Ericson, Keene, N.H., assignor to Elliot Laboratories, Inc., Fitzwilliam, N.H.
Filed Nov. 12, 1968, Ser. No. 774,696
Int. Cl. E03d *13/00*
U.S. Cl. 4—110 **27 Claims**



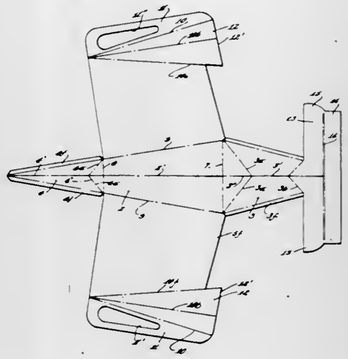
A funnel for use in the collection of urine specimens having a side wall of flexible material and two openings at either end and a rigid member coupled about one end to hold the opening in an open position and to provide a foundation for a sealing cap.

3,579,653
DISPOSABLE URINAL
Henry S. Kuhn, 609 Austin Ave., Park Ridge, Ill. 60068
Filed Sept. 5, 1969, Ser. No. 855,602
Int. Cl. A47k *11/00*
U.S. Cl. 4—110 **11 Claims**



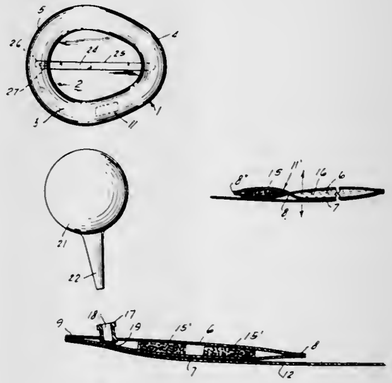


A disposable urinal comprising a container constructed of thin sheet stock such as relatively stiff paper or light board, having a bottom wall, side walls and end walls, and constructed adjacent the top thereof with a fluid inlet opening capable of assuming and retaining a generally circular configuration, the bottom and end walls being



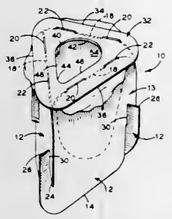
arranged for folding upon themselves to permit said side walls to be disposed in substantially parallel plane and the portions defining said inlet opening disposed substantially in such plane to provide a relatively flat compact package.

3,579,654
DISPOSABLE SELF-INFLATABLE BED PAN
Henry S. Kuhn, 609 Austin Ave., Park Ridge, Ill. 60068
Filed Sept. 5, 1969, Ser. No. 855,603
Int. Cl. A61g *9/00*
U.S. Cl. 4—113 **19 Claims**



A disposable self-inflatable bed pan comprising a body structure having an inflatable portion, constructed to produce a pan-shaped configuration when said portion is inflated, and activatable means arranged for reception in said inflatable portion and operable upon activation to effect inflation thereof, said activatable means comprising a material adapted to release a gas upon mixture with an activating liquid, with said material being disposed or disposable in said inflatable portion with said activating liquid being contained in said inflatable portion, out of contact with said material, or discharged into said inflatable portion at the time of usage.

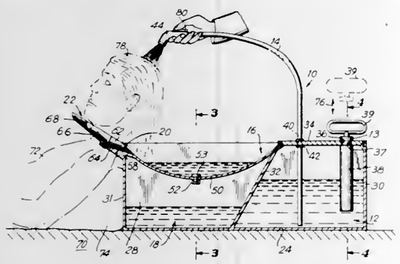
3,579,655
PORTABLE TOILET AND SINK STRUCTURES AND THE LIKE
Alan F. Sundberg, Amityville, N.Y.
(256 W. 21st St., New York, N.Y. 10011)
Filed Aug. 13, 1968, Ser. No. 752,308
Int. Cl. A47k *11/02*
U.S. Cl. 4—116 **4 Claims**



A portable toilet structure or the like which includes a plurality of side panels connected together along their respective adjacent edges. Connected to the side panels is a top panel having a through aperture. Surrounding the aperture and extending downwardly therefrom is a substantially waterproof bag. The bag is adapted to receive waste materials and the like thereby to provide a portable toilet or the like which may be assembled easily and quickly.

A method of fabricating the portable structure also is described.

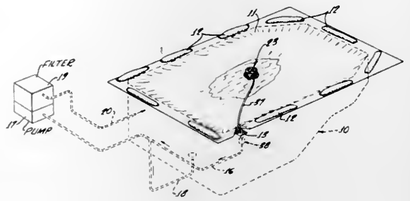
3,579,656
PORTABLE HAIR WASH SINK
Joseph S. Guarrasi, 39 Buckingham Road, Brooklyn, N.Y. 11226
Filed Feb. 20, 1969, Ser. No. 800,926
Int. Cl. A45d *19/00*
U.S. Cl. 4—159 **7 Claims**

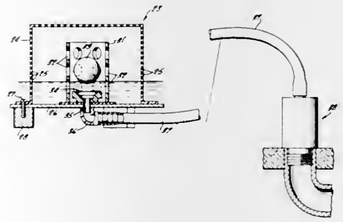


A portable hair wash sink in the form of a compact body unit including a basin, self-contained means for supplying water under pressure, and spray means for applying water to the head of the user. The sink also includes shoulder boards and a mating neck rest forming a yoke around the neck of the user. The boards and neck rest are dished to insure drainage into the sink basin.

3,579,657
SWIMMING POOL COVER DRAIN
Salvatore J. Gurrieri, Sylmar, Calif., assignor to Anthony J. Pilarski, San Fernando, Calif.
Filed Sept. 4, 1969, Ser. No. 855,238
Int. Cl. E04h *3/18*
U.S. Cl. 4—172.12 **14 Claims**

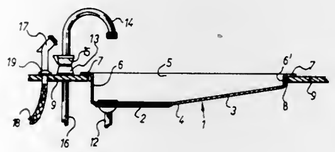
A device for pumping water from a swimming pool cover including a first unit located on a swimming pool cover, the first unit having a float valve opened by water accumulating on the cover, the valve connecting to a second unit at the pool skimmer so that water from the cover is conducted to the inlet of the pump for the pool's circulation system. A valve member in the second unit is spring-biased to a closed position, but opened in re-





sponse to suction upon the closing of the float valve, thereby providing normal system operation through the pool skimmer when no water is present on top of the cover.

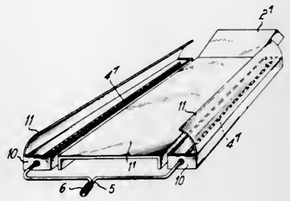
3,579,658
BATH TUB FOR INVALIDS
Rita Marie Choquette, 1589 Gouin Blvd., East Montreal, Quebec, Canada
Filed Dec. 9, 1968, Ser. No. 782,059
Int. Cl. A47k *3/024*
U.S. Cl. 4—173 **3 Claims**



A bath tub primarily intended for invalid babies and to be used in hospitals specialized in the care of such babies, adapted to be fitted within a countertop opening and providing an inclined bottom wall portion to maintain the babies' head above water level, the tub being associated with a water sprayer head and flexible hose so arranged that one attendant can bathe invalid babies.

3,579,659
BUBBLE BATH DEVICE
Ludwig Baumann, Niederhelfenschwil, Switzerland
Filed Feb. 28, 1969, Ser. No. 803,170
Claims priority, application Belgium, Feb. 29, 1968, 711,465
Int. Cl. A61h *33/02*
U.S. Cl. 4—180 **7 Claims**

The invention provides a bubble bath device which is operated by compressed-air generating means such as a blower or a compressor and comprises a support for the body of a user and at least one tubular conduit which is immersed in a foam forming emulsion and extends along at least part of the periphery of the support in a plane below the upper surface of the support. The tubular conduit, which may be a hose, has a plurality of very fine



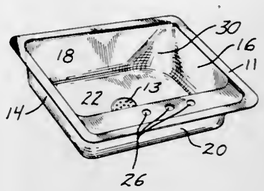
lateral apertures and is in communication with the compressed-air generating means so that upon actuation of the latter compressed air will be discharged through the apertures into the foam forming emulsion to produce small bubble foam which rises on both sides of the support so as to envelop the body of the user from above.

3,579,660
BATHTUB HOIST DEVICE
Willard H. Whitaker, 314 W. Tate St., Corinth, Miss. 38834
Filed Sept. 6, 1968, Ser. No. 758,052
Int. Cl. A47k *3/12*
U.S. Cl. 4—185 **3 Claims**

A bathtub hoist device comprising lift means including a support for motor drive means and starter means for the motor means which can be operated by a person using the lift, and seat means detachably connected to bar support means, said bar support means being pivotally connected to a fixed member, and cable means disposed on drum means and connected to said bar means for lowering and raising said bar means and the seat means detachably connected thereto.

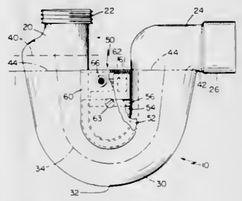
3,579,661
SINK
Millard H. Lien, Omaha, Nebr., assignor to Crane Co., Chicago, Ill.
Filed May 6, 1969, Ser. No. 822,152
Int. Cl. E03c *1/18*
U.S. Cl. 4—187 **2 Claims**

A plumbing fixture, such as a kitchen sink, wherein at least one corner has a radius of curvature which progressively increases from the top portion of the sink to the bottom portion. Such variation in radii enables the draining of kitchen utensils, such as pots or pans, which are of different diameter, by moving the utensil to the appro-



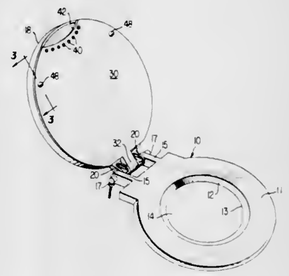
priate position along the sink corner which substantially conforms to the curvature of the utensil.

3,579,662
FREEZE PROTECTED WASTE TRAP
Robert D. Lowry and Russell B. Strout, Winchester, Mass., assignors to Lowry Development Corporation, Winchester, Mass.
Filed Mar. 20, 1969, Ser. No. 808,905
Int. Cl. E03c *1/284*
U.S. Cl. 4—206 **5 Claims**



A waste trap for water drains having a U-shaped conduit the legs of which have internal transverse cross sectional areas increasing progressively upwardly of said legs to the round top level of water contained in said trap the waste trap being provided with an electrical heater element and thermostatic control.

3,579,663
TOILET SEAT COVER
Robert Paul Leiter, 1219 Poplar Grove Drive, and Thomas G. Ware, 1029 N. Virginia Ave., both of Atlanta, Ga. 30306
Continuation-in-part of application Ser. No. 755,137, Aug. 26, 1968. This application Nov. 18, 1968, Ser. No. 776,318
Int. Cl. E03d *9/00*
U.S. Cl. 4—230 **8 Claims**

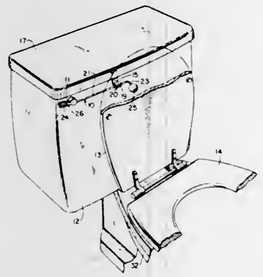


A toilet seat assembly having a cover pivotally secured to the seat member wherein there is provided a flat fo-

raminous bottom member which has a common pivot with the cover, and cooperating members on the cover and flat bottom such that they may be snapped together or pulled apart. A central island having a pair of diverging walls extending therefrom is located on the inside face of the cover to define an open area for receiving deodorant material which is held in place by the flat bottom member when interlocked with the cover.

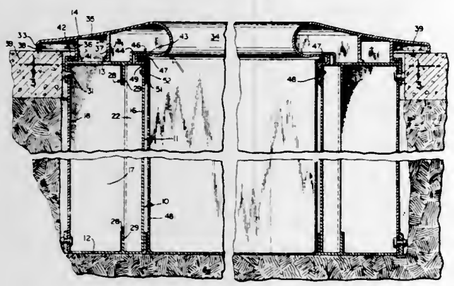
3,579,664
TOILET FLUSHING ATTACHMENT
Evar C. Johnson, 2927 9th St., Rockford, Ill. 61109
Filed July 28, 1969, Ser. No. 845,316
Int. Cl. E03d *5/04*
U.S. Cl. 4—250 **16 Claims**

A crank oscillatable by pressure rearwardly against the toilet seat lid turns a cross-shaft supportedly horizontally on the front of the flushing tank to operate

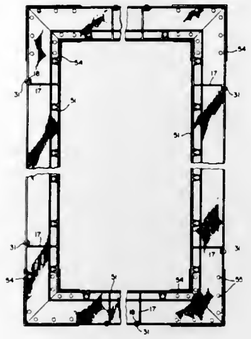


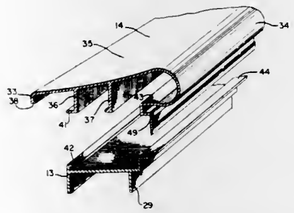
another crank on the other end of the cross-shaft. The latter crank has an eye on its outer end slipped loosely over the operating handle pivoted on the flushing tank, whereby to flush the toilet.

3,579,665
SWIMMING POOL STRUCTURE
Layle B. Barker, Henrico County, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed Oct. 11, 1967, Ser. No. 674,391
Int. Cl. E04h *3/16*
U.S. Cl. 4—172.19 **11 Claims**



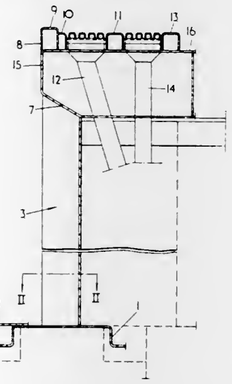
A swimming pool structure wherein a combination of interlocking aluminum side wall members are retained at their lower and upper ends in channels of lower and upper channel members, and a coping member surmounts the upper channel member. The coping and upper channel members are provided with mutually interlocking means, and a portion of the latter is formed





with a retaining channel to receive the edge of a pool liner.

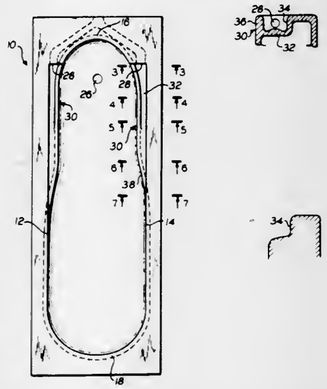
3,579,666
SWIMMING POOL
Ebbe Torsten Leonard Regebro, Lunnagardsvagen 15, and Karl-Olof Pettersson, Engagatan 50, both of Alvesta, Sweden
Filed Jan. 21, 1969, Ser. No. 792,609
Claims priority, application Sweden, Jan. 31, 1968, 1,241
Int. Cl. E04h *3/16*
U.S. Cl. 4—172.19 **9 Claims**



A swimming pool formed of plates of light weight metal such as aluminium. The walls of the pool are

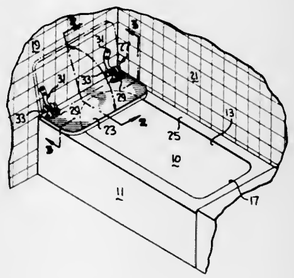
formed of elements which are concave vis a vis the interior of the pool and have no conventional splash channels but instead are provided with a peripheral portion extending outwardly from the top of the walls which include spaced apart inverted U-shaped beams with grids therebetween for receiving splash-over water. The innermost inverted U-shaped beam forms the edge of the pool which coincides with the level of water in the pool when it is filled.

3,579,667
BATHTUB CONSTRUCTION
Gino Giglio, 32 Cornelia St., New York, N.Y. 10014
Filed June 5, 1969, Ser. No. 830,642
Int. Cl. A47k *3/00*
U.S. Cl. 4—181 **4 Claims**



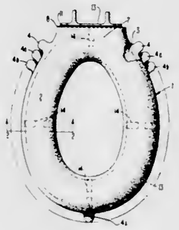
A bathtub formed with a water distribution channel arranged along one side of the tub adjacent the water entry to the tub, with the channel formed to guide the entering water horizontally along the upper edges of the side walls of the tub, whence the water falls along the side walls to continuously wash the side walls of the tub as the water is being admitted thereto, to prevent water falling through air to eliminate splashing, and to impart a swirling, mixing motion to water in the tub. The channel is formed with an inner wall of progressively decreasing height serving to implement desired direction of the water.

3,579,668
BATH AND SHOWER SEAT
Manuel Aronovitz, 913 Tampa St., Tampa, Fla. 33602
Filed Mar. 21, 1969, Ser. No. 809,102
Int. Cl. A47k *3/12*
U.S. Cl. 4—185 **7 Claims**



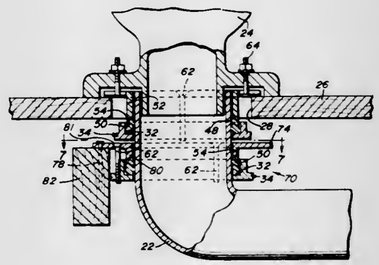
The seat of the present invention comprises an easily installed panel having a plastic finish which can be colored to match any bathroom color scheme. In one embodiment the seat, when in use, is supported in a horizontal position by the edges of the sides of a bathtub and is pivotable upward so as to be stored vertically against a wall above the tub. When stored the seat may be recessed in the wall and provided with a magnetic latch to secure the stored seat. In another embodiment the seat when in use, is supported by its own hinge, and is pivotable downward to its vertical storage position. The latter embodiment is suited for use in showers since support by sides of a bathtub is not required.

3,579,669
SANITARY SINGLE USE TOILET SEAT COVERS
Gideon Loewenstein, 39—37 46th St., Long Island City, N.Y. 11104
Filed Apr. 14, 1969, Ser. No. 815,550
Int. Cl. A47k *13/14*
U.S. Cl. 4—245 **4 Claims**



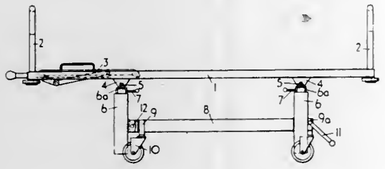
A package of sanitary, disposable seat covers is formed by superimposed seat covers adapted to be secured to the toilet seat. Each seat cover has a tab extending from its outer periphery, which tab is offset from the tabs of the adjacent seat covers, whereby the assembly of seat covers provides an arrangement of staggered tabs to thereby facilitate the gripping of a tab with the fingers.

3,579,670
PIPE CONNECTOR
Emil A. Frank, Long Beach, Calif., assignor of fractional part interest to Ronald L. Frank, Long Beach, Calif.
Filed July 2, 1968, Ser. No. 742,040
Int. Cl. F16l *37/04*
U.S. Cl. 4—252 **8 Claims**



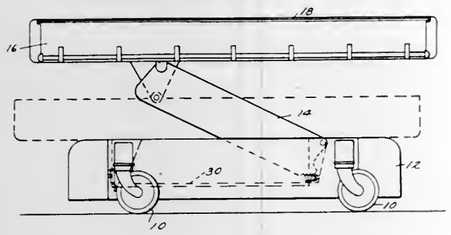
A device for connecting pipes together, connecting a pipe to a water closet or supporting a closet bend pipe which utilizes a collar squeezing a resilient gasket against the pipe to provide a water-tight, mechanical seal without the problems usually associated with the normal hot lead type of sealant.

3,579,671
ADJUSTABLE BED
Helmut Kötter, Schweicheln-Bermback, Germany, assignor to Joh. Stiegelmeyer & Co. G.m.b.H., Herford, Westphalia, Germany
Filed Feb. 19, 1969, Ser. No. 800,628
Claims priority, application Germany, June 7, 1968, P 17 66 522.4
Int. Cl. A61g *7/00, 7/10*
U.S. Cl. 5—62 **9 Claims**



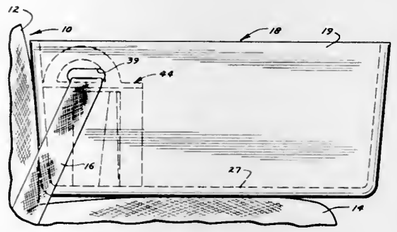
An adjustable bed including a chassis, a bed frame disposed on the chassis, two or three hydraulic cylinder and piston units disposed at the ends of the bed, an articulated connection between the cylinder and piston unit and the bed frame so that the bed frame may be moved to various elevated and/or inclined positions.

3,579,672
METHOD AND APPARATUS FOR MOVING OBJECTS
Laurel A. Koll and Walter Crook, Jr., Ruleville, Miss., assignors to Diamondhead Properties, Inc.
Continuation-in-part of application Ser. No. 706,755, Feb. 14, 1968. This application Feb. 5, 1970, Ser. No. 9,029
Int. Cl. A61g *7/08, 7/10*
U.S. Cl. 5—81 **28 Claims**



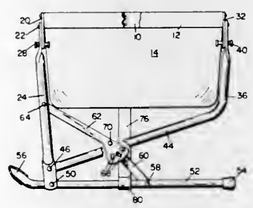
An improved transporter device includes a pair of superposed aprons formed as endless belts or portions thereof and which function to receive, carry, or deposit objects in accordance with desired transferring and carrying requirements. Each of the aprons is supported by a non-rigid support means which maintains supporting surfaces of the pair of aprons in substantially horizontal planes of operation for transferring objects from one horizontal surface to a surface provided on the transporter device itself. Transferring movements of the two aprons can be carried out by controlled translating movements of the supporting means contained within the two belts, and the lower apron or belt includes a section which is fixed relative to a base portion of the transporter device so that the lower apron does not have to be driven. In addition, the upper apron defining belt can be alternatively driven or not driven relative to its support means in accordance with loading, unloading, or positioning functions that may be desired. The non-rigid support means are made up of a number of flexible fingers so that the apron can conform to irregularly shaped objects, such as a patient being moved onto or from a hospital bed, so that the weight of the object is transferred downwardly through the aprons and their associated support means to an area of surface directly beneath the object when the object is supported by the apron. Control means are provided for controlling cycles of loading, unloading and positioning with the transporter device, and the device offers a variety of functions and methods of use.

3,579,673
COMBINATION CAR SEAT AND CRIB
Kenneth A. Hirschey, 6804 Southdale Road, Edina, Minn. 55435
Filed Dec. 3, 1968, Ser. No. 780,818
Int. Cl. A62b *35/00;* **A47d** *7/00, 9/00*
U.S. Cl. 5—94 **9 Claims**



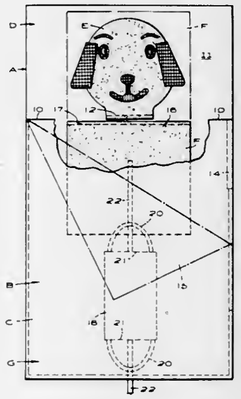
A combination car seat and crib for children including a crib portion composed of a bottom wall and four vertical walls formed from a strong lightweight molded material, e.g. foamed polystyrene, within which the child lies when sleeping. The child's head is cradled between energy absorbing bumpers consisting of vertical partitions molded integrally with the crib at one end. A removable seat slides into place above the partition. Seat belts normally provided with the car secure the crib or crib and seat in place and also function to hold the child in the seat.

3,579,674
INFANT'S SAFETY CAR BED
Zoel W. Blais, Templeton, and Harold F. Shaw, Leominster, Mass., assignors to Thayer, Inc., Gardner, Mass.
Filed Nov. 13, 1969, Ser. No. 876,293
Int. Cl. A47d *7/04*
U.S. Cl. 5—94 **10 Claims**



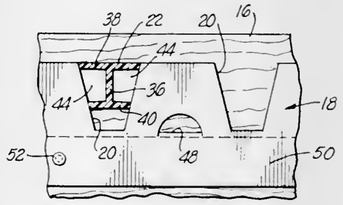
A folding car bed comprising an upper open rectangular frame and a depending flexible body support with a mattress therein, a safety harness, a strap on the safety harness extending through the mattress and the bottom of the flexible support for securement underneath the same; a folding leg frame on the upper frame at each end thereof, each leg frame comprising a forwardly extending free-ended foot having a rearwardly extending spur thereon, each foot being pivotally mounted with respect to its leg, an adjustable locking bracket for each foot, said leg frames being foldable flatwise against the upper frame.

3,579,675
CHILD'S SLEEPING BAG
Leila C. Scheer, 1272 Balboa Ave., Burlingame, Calif. 94010
Filed Feb. 24, 1970, Ser. No. 14,260
Int. Cl. A47g *9/00*
U.S. Cl. 5—343 **6 Claims**



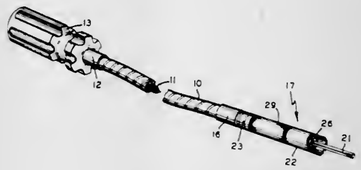
A child's sleeping bag having a lower panel projecting endwise beyond the top edge of an upper panel at the head end of the bag, with an ornamental pillow attractive to a child secured to the projecting part, and a flap secured at an edge to the lower panel so that the flap may be moved into a position to overlie and protect the pillow from being soiled when a child occupies the bag, the flap being foldable into a compartment between the panels to thus expose the pillow.

3,579,676
BEEHIVE
Paul W. Pierce, 1630 W. 9th St., Upland, Calif. 91786
Filed Apr. 16, 1969, Ser. No. 816,679
Int. Cl. A01k *47/02*
U.S. Cl. 6—2 **10 Claims**



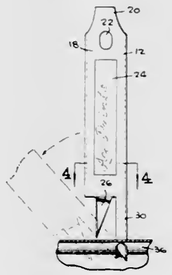
A bee frame and a super for a beehive. The bee frame is a unitary molded plastic structure including a permanent, molded plastic comb foundation characterized by a novel cellular configuration and integrally joined to the frame bars in such a way as to condition the frame to support the weight of a honeycomb for an extended period of time without warping and to permit machine uncapping of the comb. The super has notched frame supports of novel configuration for supporting a number of bee frames in laterally spaced side by side relation to provide an optimum spacing between adjacent frames and permit handling and transportation of a hive containing bees and honeycomb without damage to the bees or honeycomb.

3,579,677
FLEXIBLE ROTARY COMPOUND TOOL
Robert Ullman, Wilton, Conn., assignor to Ullman Devices Corporation, Ridgefield, Conn.
Filed Feb. 7, 1969, Ser. No. 797,650
Int. Cl. B25f *1/04*
U.S. Cl. 7—1 **6 Claims**



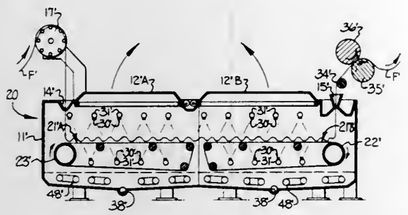
A complete self-contained compound tool, useful in particular as a carburetor-distributor adjustment device. It incorporates a flexible shaft-flexible tube combination that is capable of functioning through a tortuous path and integrates in a single head two implements, a hex key and a screw driver, each being rendered alternately usable by a sliding head adjustment.

3,579,678
PAINT CAN RIM PIERCER
James L. Regan, Hayward, Calif. (409 Dunkel St., Fairbanks, Alaska 99701)
Filed Apr. 30, 1969, Ser. No. 820,511
Int. Cl. B25f *1/04;* **B67b** *7/44*
U.S. Cl. 7—14.1 **11 Claims**



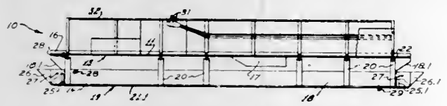
A paint can rim trough punch means for punching drain holes in the rim trough of a paint can including a handle member having a hook on one end receivable under the paint can rim and an inwardly positioned outwardly extending V-shaped piercer member movable when the hook is positioned under the rim to pierce the rim trough.

3,579,679
TENSIONLESS LIQUID TREATING APPARATUS AND METHOD
David M. Willis, Spartanburg, S.C., assignor to Jonathan Logan Inc., New York, N.Y.
Filed Dec. 10, 1968, Ser. No. 782,587
Int. Cl. B05c *5/00*
U.S. Cl. 8—151 **11 Claims**



A method of and apparatus for treating a running length of textile web material with a fluid wherein the textile web material is transported through a fluid treating zone without any appreciable tensional forces being imposed thereon and while in a substantially tension-free state by overfeeding the textile web material onto a horizontally moving supporting surface, advancing the textile web material through the treatment zone while spraying opposite faces of the web material with treatment fluid and while causing the web material to follow an undulating path of travel with any given portion thereof only intermittently engaging the supporting surface.

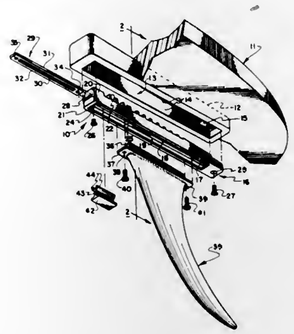
3,579,680
MOTORIZED FLOAT
Leslie R. McLean, Box 414, 414 Strathconia Ave., Kelowna, British Columbia, Canada
Filed Mar. 3, 1969, Ser. No. 803,732
Int. Cl. B63b *35/00;* **B63c**
U.S. Cl. 9—1 **3 Claims**



A motorized float for supporting house trailers having a trailer-supporting deck structure supported by a plurality of elongated fore and aft flotation units, each of the latter being formed of at least three pontoons which are arranged in a tight, compact bundle by straps extended therearound and connected to the deck structure. A protective member connected to the straps extends longitudinally of and beneath each bundle of pontoons.

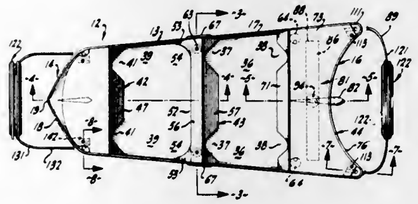
3,579,681
SECTIONAL AND LONGITUDINALLY ADJUSTABLE SURFBOARD FIN ASSEMBLY
Karl D. Pope III, 6377 Clemens St., and Thomas H. Morey, 36 Lincoln Drive, both of Ventura, Calif. 93003, and Robert R. Tierney, 412 Mallory Way, Ojai, Calif. 93023
Filed Apr. 1, 1969, Ser. No. 811,810
Int. Cl. A63c *15/00*
U.S. Cl. 9—310 **7 Claims**

A surfboard fin assembly includes a longitudinally adjustable fin section movably mounted within an elongated channel formed by a fin base section. The fin base section has tapered exterior side walls sized for wedging engagement with tapered interior side walls of a mounting box. The fin base section can be selectively interlocked with the fin section by use of a retaining plate that is slidably coupled to the fin base section and is located in the



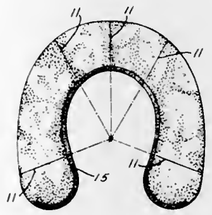
elongated channel. The retaining plate has a positioning groove for receiving a portion of the fin section.

3,579,682
SKI-BOARD
Craig A. Wood, 707 Sycamore Lane No. 1, Davis, Calif. 95616
Filed May 12, 1969, Ser. No. 823,637
Int. Cl. A63c *15/00*
U.S. Cl. 9—310B **11 Claims**



An elongated hull includes shaped spaces to receive a skier's feet. A rudder on the after end of the hull affords steering capabilities, the rudder being controlled by a bridle held by one hand of the skier, the other hand holding a lead line extending to the forward end of the hull and helping the skier to maintain balance.

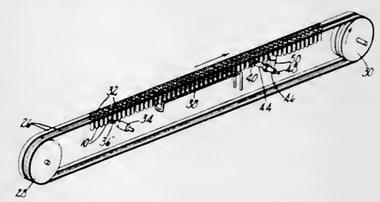
3,579,683
HORSESHOE-SHAPED LIFEBUOY AND METHOD OF MAKING THE SAME
James H. Robertson, 5238 Vineland Ave., North Hollywood, Calif. 91601
Filed Aug. 15, 1969, Ser. No. 850,432
Int. Cl. B63c *9/10*
U.S. Cl. 9—340 **12 Claims**



A horseshoe-shaped life buoy and method of making the same in which a substantially U-shaped body member

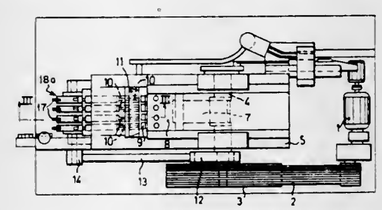
having a pair of spaced arms is formed of polystyrene foam material or the like. One or more cuts are made in the body member, which cuts extend across the entire thickness of the body member inwardly from the outer edge of the body member. The cuts permit the arms to flex, shift and "give" along the cuts. The buoy can accordingly withstand separation pressure exerted against the arms which would normally cause it to break or crack. The body member may be compressed for added strength.

3,579,684
METHODS OF MAKING SELF-LOCKING THREADED ELEMENTS
Richard J. Duffy, Salem, Mass., assignor to USM Corporation, Flemington, N.J., and Boston, Mass.
Original application Apr. 5, 1967, Ser. No. 628,683, now Patent No. 3,498,352, dated Mar. 31, 1970. Divided and this application Nov. 25, 1968, Ser. No. 778,636
Int. Cl. B23g *9/00;* **B21k** *1/44, 1/56, 1/64*
U.S. Cl. 10—10 **9 Claims**



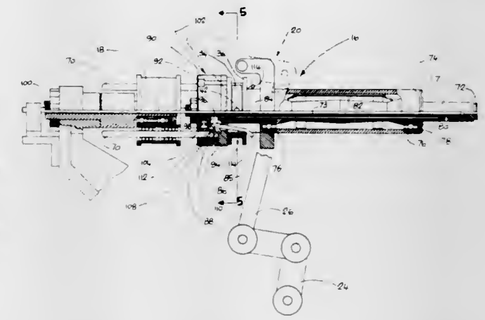
Method of making a self-locking threaded element, e.g. a screw including a strongly adhered convexly curved plastic body on its threaded surface allowing smooth assembly and giving strong frictional engagement between the element and a mating threaded surface. In the method, a stream of fine particles of heat-softenable plastic is directed against a threaded surface portion of a heated metallic element. Contacting particles are caught on the heated surface and fused by heat from the element to form a continuous plastic body which is then hardened by cooling.

3,579,685
MECHANISM FOR EJECTING WORKPIECES FROM THE MATRICES OF UPSETTING MACHINES
Gerardus Cornelis van de Meerendonk, Helmond, Netherlands, assignor to Nedschroef Octrooi Maatschappij N.V., Helmond, Netherlands
Continuation of application Ser. No. 602,001, Dec. 15, 1966. This application July 17, 1969, Ser. No. 849,552
Claims priority, application Netherlands, Dec. 17, 1965, 6516468
Int. Cl. B21k *1/44*
U.S. Cl. 10—12 **6 Claims**



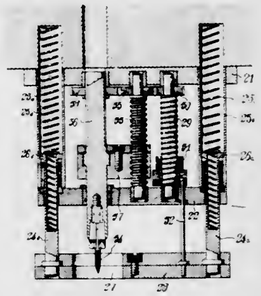
The disclosure is of an improved mechanism for ejecting a workpiece from a matrix after forming therein and includes a rocker shaft carrying an adjustable cam pivoted thereon on an axis parallel to the axis of the rocker shaft, a lever having an ejecting arm and a follower arm, the latter engaging the cam on the rocker shaft.

3,579,686
AUTOMATIC SCREW MACHINE
Jess Frank Sorenson, Yucaipa, Calif., assignor to Sorenson Engineering, Inc.
Filed Oct. 7, 1968, Ser. No. 765,391
Int. Cl. B23b *7/00, 13/00, 15/00;* **B23g** *1/00, 11/00;* **B22p** *23/00*
U.S. Cl. 10—87 **10 Claims**



An automatic screw machine with a pulley-driven collet and spindle assembly for reciprocally moving parts into and out of contact with boring tools. The assembly has two rearwardly extending rods which fit slidably within receptive openings in a drive pulley to permit its axial reciprocation while being driven by the pulley. The assembly also has a pair of chucking levers mounted to pivot about one end, under the direction of a timing cam, and exert cam-like collet opening and closing pressures on a responsive member. The machine has an index rod and an index plate with receptive holes for the rod. The plate is affixed to a cam-controlled shaft to which a tool holder is also affixed. When the index rod is moved into one of the holes in the plate, a part held by the collet and spindle assembly is guided to a particular tool on the tool holder.

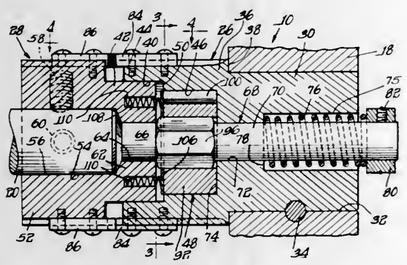
3,579,687
TAPPING APPARATUS
Hideo Hoshi, 40 Minamiide Nakaodai, Yamada-cho, Nishi-ku, Nagoyashi, Japan; and Masao Washi, 3083 Oazaikeda, Ikeda-cho, Kitaazumigun; and Hiroshi Yoshiki, 11-382 Higashi, Arigasaki, Matsumotoshi, both of Nagano-ken, Japan
Filed Sept. 30, 1968, Ser. No. 763,856
Claims priority, application Japan, Oct. 9, 1967, 42/64,686, 42/64,687
Int. Cl. B23g *1/00*
U.S. Cl. 10—129 **4 Claims**



A tapping machine in which a ball screw and a spline shaft with a tap secured at its end are mounted to a press ram in a mutually meshed relation through gearing, and

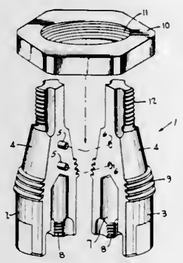
as the press ram is moved up and down, the up and down strokes of the press are converted into rotation by the ball screw, with the produced rotating force being transmitted to the spline shaft to thereby effect tapping operation.

3,579,688
TAP HOLDER
Lawrence W. Keltz, Chicago, and Charles Marek, Berwyn, Ill., assignors to The Chicago Roller Skate Company, Chicago, Ill.
Filed Apr. 28, 1969, Ser. No. 819,543
Int. Cl. B23b *31/08;* **B23g** *5/16*
U.S. Cl. 10—134 **5 Claims**



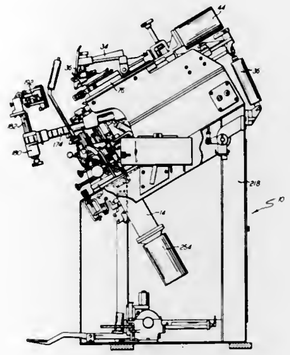
A tap holder assembly including relatively axially and rotatably movable parts with a one-way rotary clutch therebetween, and a spring-biased plate for maintaining elements of the clutch in proper assembled relationship during axial relative movement of the parts.

3,579,689
THREAD CONDITIONING AND RESTORING TOOL
Edward F. Ferkovich, 1341 S. 5th St., Raton, N. Mex. 87740
Filed Oct. 4, 1968, Ser. No. 765,190
Int. Cl. B23g *5/04, 5/06*
U.S. Cl. 10—140 **1 Claim**



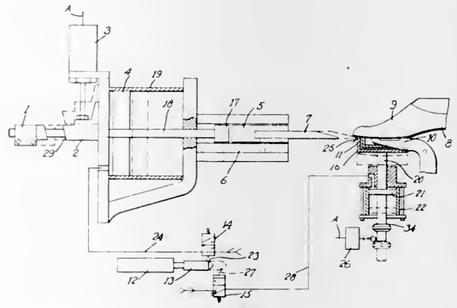
A threaded restoring tool comprising die elements having internal cutting teeth for restoring threads, a nut member in threaded engagement with external threads on the die elements which are arranged for a threaded direction of movement by the nut member which is opposite to the threaded direction of movement by the cutting teeth so that rotation of the nut member in its threaded direction of movement serves not only to tighten the die elements about the threads to be restored but causes the cutting teeth to rethread the threads to be restored by moving the cutting teeth in its opposite direction of movement.

3,579,690
TOE LASTING MACHINE
Jacob S. Kamborian, 70 Crestwood Road, West Newton, Mass. 02165
Filed Sept. 17, 1969, Ser. No. 858,667
Int. Cl. A43d *21/00*
U.S. Cl. 12—12.4 **18 Claims**



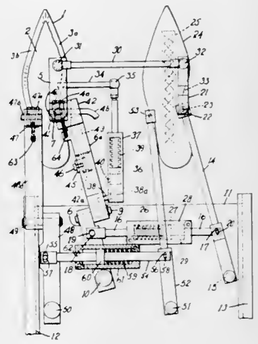
A machine for wiping the margin of the toe portion of an upper draped about a last against an insole located on the bottom of the last. The wiping is performed by wipers, having a toe to heel component of movement, that perform their wiping operation in response to the engagement of a heel clamp with the heel portion of the last while the heel clamp is locked against movement away from the last.

3,579,691
SHOE LASTING MACHINES
Rudi Fichtner, Ober Horgern, and Wilhelm Klein, Frankfurt am Main, Germany, assignors to USM Corporation, Boston, Mass.
Filed Jan. 19, 1970, Ser. No. 3,912
Int. Cl. A43d *21/00*
U.S. Cl. 12—12.4 **5 Claims**



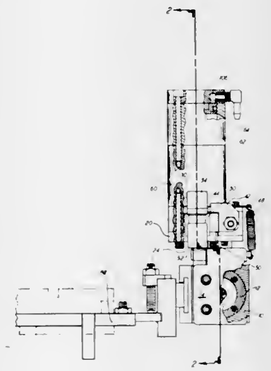
A shoe lasting machine in which a stop limits movement of wipers to an intermediate position in which an upper has been wiped over a shoe bottom only enough to hold an insole against a last bottom, and a pressure plate which previously held the insole is thereafter retracted and controls continued movement of the wipers.

3,579,692
SHOE MACHINES
Anton Muhlbach and Gerhard Lauckhardt, Frankfurt am Main, Germany, assignors to USM Corporation, Boston, Mass.
Filed Feb. 16, 1970, Ser. No. 11,597
Claims priority, application Germany, Feb. 25, 1969, P 19 09 474.7
Int. Cl. A43d *21/00*
U.S. Cl. 12—8.3 **6 Claims**



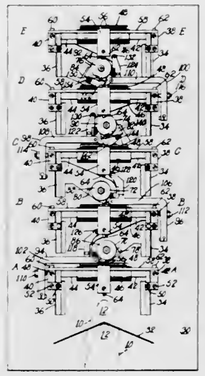
A machine for automatically operating on the margin of a shoe bottom including a rotary tool movable along the margin and cooperating with guide means for directing lateral movement of the tool relative to the margin. The guide means includes a light responsive means such as a photocell which registers on a light guide comprising a light source and a template located to the front of the light source.

3,579,693
PINCERS ASSEMBLY
Charles A. Robinson, Waltham, Mass., assignor to Jacob S. Kamborian, West Newton, Mass.
Filed Mar. 9, 1970, Ser. No. 17,406
Int. Cl. A43d *23/00*
U.S. Cl. 12—14.5 **6 Claims**



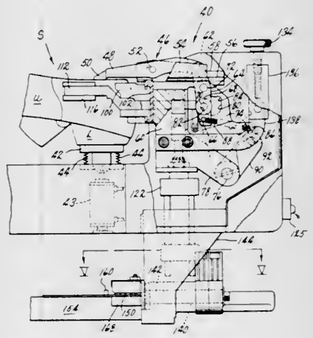
A pincers assembly for stretching an upper about a last and moving the margin of the upper inwardly of the insole periphery. The assembly comprises a pincers that is mounted in a housing with the housing being mounted to a support for heightwise movement and the support being mounted to a base for inward-outward movement.

3,579,694
AUTOMATIC SHOE MACHINERY AND OPERATION OF THE SAME
Herman A. Imhof, Hamilton, Mass., assignor to USM Corporation, Boston, Mass.
Filed June 2, 1969, Ser. No. 829,307
Int. Cl. A43d *25/00;* **A43b** *13/00*
U.S. Cl. 12—17 **17 Claims**



A through feed finishing machine designed to provide an operation such as sole reduction on defined margins or edges of an unattached shoe sole initiated relative to the ball point of the sole. The machine includes pairs of finishing tools, for example, rotatable reducing tools mounted in biased relationship to operate on opposite sides of a sole. Pressure equalizing means are mounted opposite each of the tools to assist in keeping the sole moving along a path of travel through the machine and insure uniform finishing by each of the tools during the finishing operation of the lengthwise margins at predetermined points defined relative to the ball points of the sole. The sole is urged through the machine by drive rolls and is stabilized by holddown rolls acting in pairs.

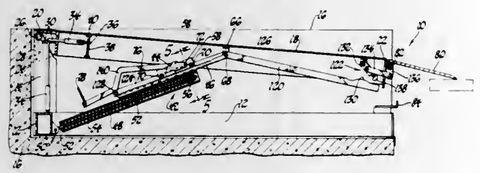
3,579,695
SHOE SUPPORTS
Herbert W. Boot, Leslie R. Parr, and Shirley L. W. Fudger, Leicester, England, assignors to USM Corporation, Boston, Mass.
Filed Oct. 8, 1969, Ser. No. 864,704
Claims priority, application Great Britain, Oct. 10, 1968, 48,014/68
Int. Cl. A43d *21/00, 23/00*
U.S. Cl. 12—127 **6 Claims**



A shoe support for holding a shoe bottom upmost in position to be engaged by tools which rough the marginal

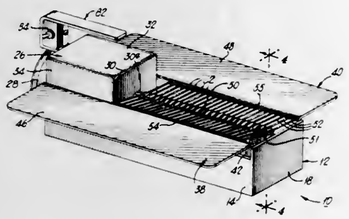
portion of the overlasted upper. The support includes a holddown foot which engages the bottom of the shoe at the heel area. Means are provided for selectively removing the holddown foot to an inoperative position to permit the tools to act on the entire margin from toe to heel as distinguished from only from the toe to the heel breast line when the holddown foot is in operative clamping position.

3,579,696
DOCKBOARD
Robert W. Hecker, Jr., Clare, Mich., and Robert C. Beckwith, Milwaukee, Wis., assignors to Loomis Machine Company, Clare, Mich.
Filed Dec. 30, 1968, Ser. No. 787,652
Int. Cl. B65g *11/00*
U.S. Cl. 14—71 **22 Claims**



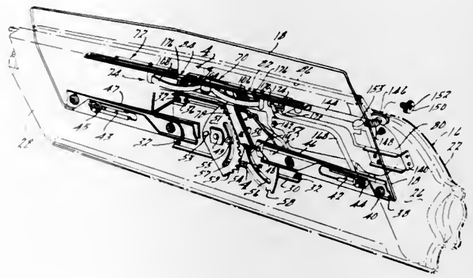
A dockboard assembly including a ramp pivotally connected to a support means and biasing means urging the ramp to pivot upwardly. A releasable holding means acts in opposition to the biasing means for restraining the biasing means from raising the ramp. A lip is pivotally connected to the ramp for pivotal movement between an extended position and a pendent position. The improvement is to include a control means responsive to the pivotal movement of the lip for releasing the holding means so that the ramp will automatically pivot upwardly.

3,579,697
MEAT CLEANING BRUSH
Gilbert L. Smith, 1305 23rd St., Peru, Ill. 61354
Filed Dec. 1, 1969, Ser. No. 881,157
Int. Cl. A46b *13/02*
U.S. Cl. 15—3.1 **12 Claims**



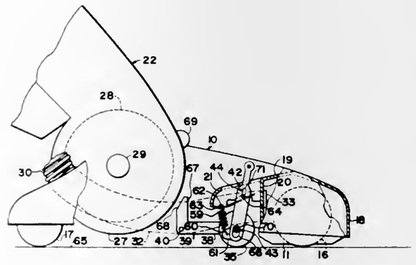
A meat cleaning appliance for removal of foreign material from the surface of pieces of meat comprising a housing having opposite sidewalls, a grid structure between said sidewalls for supporting the meat on a cleaning pass, and rotary brush means mounted for rotation in said housing on an axis spaced longitudinally between said sidewalls below said grid structure. The grid structure comprises a plurality of spaced apart V-shaped grids having the apexes spaced below the upper edges of the housing sidewalls and the radial bristles of the brush means project upwardly above the apexes of the grids for cleaning engagement with the meat surfaces.

3,579,698
TAILGATE WINDOW WASHER
Marcel E. Verdoodt, Warren, and Klaus A. Michalke, Utica, Mich., assignors to Chrysler Corporation, Highland Park, Mich.
Filed Aug. 30, 1968, Ser. No. 756,615
Int. Cl. A47l *1/02*
U.S. Cl. 15—250.1 **8 Claims**



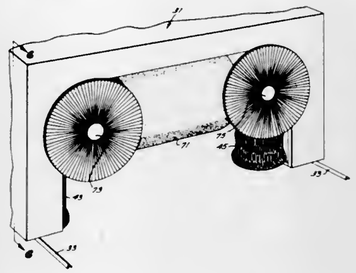
A washer mechanism for the window glass of a tailgate of a motor vehicle of the station wagon type in which a pair of wiper blades are mounted within the gate for selective movement between wiping and retracted positions in response to up and down movement of the window glass with a plurality of nozzles, supplied by a reservoir and pump assembly positioned within the gate, positioned directly below the wipers to selectively direct cleaning fluid against the window glass to facilitate the wiping operation. The wipers, in their wiping position, remain stationary and the glass is moved past the wipers to accomplish the wiping and washing action.

3,579,699
SUCTION CLEANER NOZZLE ADJUSTMENT
Jerry L. Balzer, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Feb. 20, 1969, Ser. No. 800,893
Int. Cl. A47l *5/34*
U.S. Cl. 15—361 **5 Claims**



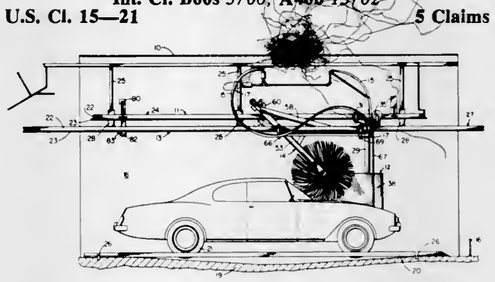
In an upright suction cleaner, movement of the propeling handle to its rest position raises the nozzle from one of a plurality of selected operative positions to an inoperative position and renders a nozzle adjusting device ineffective, and movement of the handle from its rest position renders the nozzle adjusting device effective to reposition the nozzle to any one of the plurality of positions selected prior to movement of the handle to its rest position.

3,579,700
CAR WASHING APPARATUS
David Merl Haley, Glendale, Calif., assignor to California Car Wash Systems, Inc., Sun Valley, Calif.
Filed Aug. 1, 1969, Ser. No. 846,851
Int. Cl. B60s *3/06*
U.S. Cl. 15—21 **4 Claims**



Car washing apparatus including a moveable frame to be advanced over a stationary car. A pair of vertically disposed side brushes are carried from the frame and control means are provided for selectively moving the brushes transversely across the ends of the car and for holding them at the respective sides of the car while the frame is moved longitudinally thereof. A safety control is responsive to such brushes engaging projections at the end of the car during their transverse travel to cause the frame to back away from the car and move the brushes clear of the projections so they can continue their transverse travel.

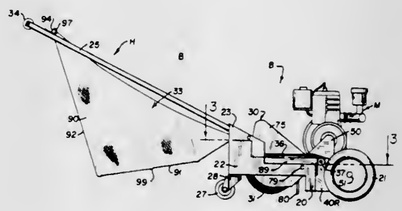
3,579,701
AUTOMATIC CAR WASHER
Clair R. Crisp, Jr., 3308 E. 30th Ave., Spokane, Wash. 99203
Filed June 3, 1968, Ser. No. 734,083
Int. Cl. B60s *3/06*; **A46b** *13/02*
U.S. Cl. 15—21 **5 Claims**



Washing mechanism for a stationary automobile providing a first brush rotatable about a vertical axis transiting about the car and a second brush rotating about a horizontal axis transiting across the top with mechanical linkage therebetween causing the vertical brush to move the horizontal brush. The invention provides auxiliary systems for application of washing and auxiliary solutions. The device is economic in construction and adapted particularly for attendantless coin activated operation.

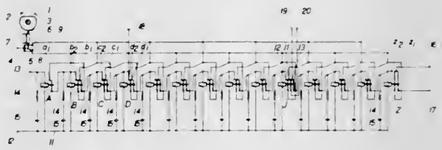
3,579,702
SWEEPER
David R. Thompson, Denver, Colo., assignor to Rental Equipment Manufacturing Corporation, Denver, Colo.
Filed July 22, 1969, Ser. No. 843,608
Int. Cl. E01h *1/04*
U.S. Cl. 15—79 **8 Claims**

A self-propelled, wheel mounted sweeper carrying an engine to drive the unit; a sweeper brush adapted to be rotated to pick up debris on a lawn, ground surface or the like with the brush being directly connected to the engine to rotate it at a fixed speed with respect to the speed of rotation of the engine. This sweeper unit includes a pair of drive wheels mounted upon a shaft and operatively connected to the engine to propel the unit. This connection to the engine is through a differential carried upon a drive shaft connected to the engine and a driving shaft connected to the drive wheels. The differential is free to rotate upon these shafts and when being so rotated by the driven shaft, it does not apply any driving torque to



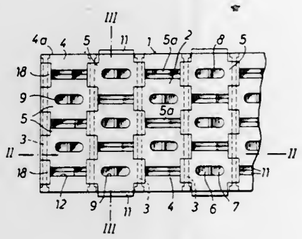
the driving shaft. A brake is provided to reduce the rate of rotation of this differential or to stop its rotation completely and in either case, impart driving torque to the driving shaft. The driving shaft rotates in a direction opposite to the driven shaft when so restrained by the brake. This action is advantageously used to permit the drive wheels to rotate in a forward direction to propel the sweeper, while at the same time the engine and the sweeper brush rotate in the opposite direction to effect an overthrow of debris into a basket carried behind the sweeper.

3,579,703
ARRANGEMENTS FOR CREATING DELAYED ELECTRIC CONTROL EFFECTS IN RESPONSE TO THE RECEPTION OF ELECTRIC IMPULSES
Alfred Schmermund, 62 Kornerstrasse, Gevelsberg, Westphalia, Germany
Filed Mar. 3, 1966, Ser. No. 531,550
Claims priority, application Great Britain, Mar. 12, 1965, 1,048/65
Int. Cl. H01h *47/24*
U.S. Cl. 317—124 **7 Claims**



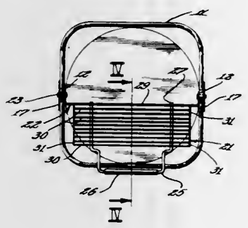
An arrangement for creating a delayed electric control effect in response to the reception of an electric impulse comprises a relay chain including a plurality of relays connected so that on energization of any of the relays (except for the last relay of the chain) a succeeding relay is prepared for being energized and receives a voltage to energize said succeeding relay when subsequently a switch actuator operates a timing switch, the electric impulse energizing the first relay of said relay chain, and at least one of the succeeding relays having means for creating the control effect when said one relay is energized. The relays of the relay chain may be electromagnetic relays or photoelectric relays.

3,579,704
ARTICULATED FLOOR MAT
Hans Holzl, Maulach, Germany, assignor to Kunststoffe, Hans Holzl KG, Maulach, Germany
Filed Feb. 25, 1969, Ser. No. 801,963
Claims priority, application Germany, Oct. 12, 1968, P 18 02 766.2
Int. Cl. A47l *23/22;* **A47g** *27/02*
U.S. Cl. 15—215 **9 Claims**



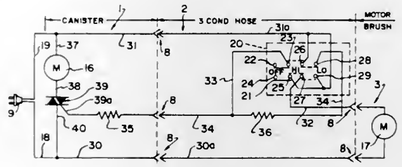
An articulated floor mat formed of hingedly interconnected links each having internal dirt chambers, two opposed marginal connecting portions and an enlarged mid portion which is wider at its base than at its upper face. The hinging links fit together in such a manner that a mat base is formed which is continuous and uninterrupted. The upper face of the mat comprises a plurality of relatively small openings to permit dirt to fall into said dirt chambers.

3,579,705
PAIL HAVING MOP WRINGING GRILL
Gordon L. Blumenschein, Box 122, Lake Villa, Ill. 60046
Filed Jan. 23, 1969, Ser. No. 793,351
Int. Cl. A47l *13/58*
U.S. Cl. 15—260 **7 Claims**



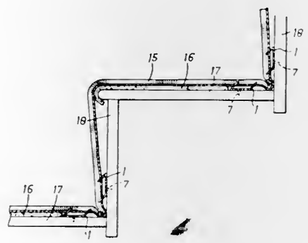
Mop pail structure in the form of a round plastic pail having a tapered wall and having a rectangular open frame pressed along the outside of the wall of the pail and forming the top of the pail into a rectangular open pail structure. The open frame cooperates with the normal pivot ears for the conventional bail of the bucket, to form a pivotal mounting for a grill-like bail. The grill-like bail is in the form of a rectangular grill having a handle on the outer side thereof, which may be used to carry the pail from place to place, and may be engaged with the top of the pail to accommodate the placing of a mop on the grill and the squeezing of the mop by the pressure of the foot. The rectangular open frame not only forms the top of the pail into a generally rectangular form, to obtain a greater area for the grill, but also strengthens the pail to the extent that heavy foot pressure may be exerted on the mop and grill without deforming or overturning the pail during a mop wringing operation.

3,579,706
VACUUM CLEANER MOTOR CONTROL
Thomas E. Hetland, St. Paul, Minn., assignor to Whirlpool Corporation
Filed Nov. 12, 1968, Ser. No. 774,922
Int. Cl. A47l *5/36*
U.S. Cl. 15—327 **10 Claims**



A vacuum cleaner having a first electric motor for a motor fan unit, a second electric motor for a floor contacting motor brush unit and a switch for controlling both of the motors that can conveniently be mounted on the handle of the hose assembly for connection to the motor brush unit. The switch control mechanism preferably comprises a first switch circuit including an electric current varying means for varying the current to the first motor and thus the degree of suction of the suction unit and a second switch circuit for energizing the motor of the motor brush unit in cleaning the floor.

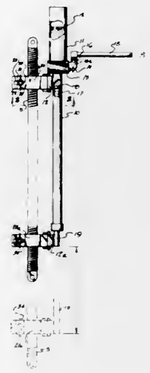
3,579,707
FASTENING DEVICES FOR CARPETS
Sidney Whistler, Maidstone, England, assignor to Whistler Green Engineering Products Limited, Rushden, Northamptonshire, England
Filed Sept. 19, 1968, Ser. No. 760,752
Claims priority, application Great Britain, Sept. 21, 1967, 43,083/67
Int. Cl. A47g *27/04*
U.S. Cl. 16—8 **5 Claims**



A carpet fastener is formed of a length of strip material at least one of the edges of which is bent to form an upwardly-extended flange having a series of spikes which project from it and which will enter the carpet to hold the latter. Preferably both edges of the strip are bent up and carry spikes and the planes of the flanges and of the spikes are substantially parallel to each other and form acute angles with the plane of the floor on which the fastener is mounted.

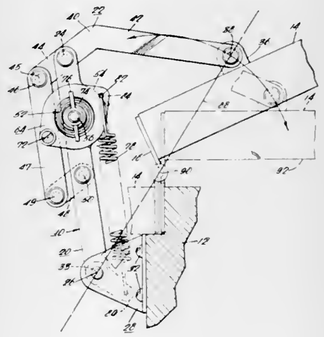
3,579,708
SPRING CHECK
James O. Lee, 243 Olive, Claremont, Calif. 91711
Filed Mar. 24, 1969, Ser. No. 809,613
Int. Cl. E05f *3/10*
U.S. Cl. 16—52 **1 Claim**

A spring check comprising a hydraulic cylinder having a piston movable therein, a fastener on the cylinder for connection to one end of the spring, a second fastener on the extending end of the piston for connection to the other end of the spring, a fluid receptacle, and an adjustable check valve between the receptacle and the hydraulic



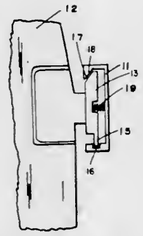
cylinder, the fastener consisting of a pair of pivotally connected plates having arcuate portions surrounding the spring, and a bolt and wing nut connection for clamping the plates about the spring.

3,579,709
DOOR RETURN AND CHECK MECHANISM
Charles G. Pierie, 1460 Creek Road, Huntingdon Valley, Pa. 19006
Filed Dec. 24, 1969, Ser. No. 887,969
Int. Cl. E05f *1/08*
U.S. Cl. 16—65 **12 Claims**



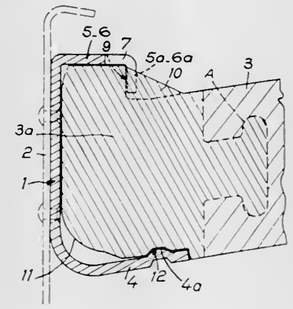
A door return mechanism including door checking means for slowing the rate of return as the door approaches its closed position. The return mechanism includes a coil spring which, in addition to its door return function, serves to hold the door open when the linkage is moved to an over-center position. The checking means comprises a disc-type brake, the brake surfaces of which are maintained in frictional engagement by an adjustable spring force. The brake is mounted across a parallel linkage which is arranged to provide a greater angular movement of the brake surfaces and hence a greater braking effect as the door approaches the door frame.

3,579,710
TRAVERSABLE HARDWARE IN GUIDEWAY FOR SHELF OR DRAPERY USE
Rudolf E. Gartzke, Madison, Wis., assignor to Gartzke's Refrigeration, Inc., Madison, Wis.
Continuation-in-part of applications Ser. No. 650,480, June 30, 1967, and Ser. No. 691,104, Dec. 4, 1967. This application Sept. 9, 1968, Ser. No. 766,663
Int. Cl. A47h *15/00;* **E05d** *13/02*
U.S. Cl. 16—93 **9 Claims**



A guideway and member traversable therein is shown; the member is resiliently urged into contact with the guideway to resist movement by force applied through a moment arm. The guideway is configured as a slotted box section wherein the member is urged against the inner surfaces of lip projections bounding the slot.

3,579,711
MEANS FOR ATTACHING A DETACHABLE HANDLE FOR KITCHEN UTENSIL VESSELS
André J. Nicolin, Paris, France, assignor to L'Equipement par l'Acier Inoxydable (Equipinox), Paris, France
Filed July 3, 1969, Ser. No. 838,766
Claims priority, application France, July 10, 1968, 158,659; Dec. 3, 1968, 176,433
Int. Cl. A47b *45/02*
U.S. Cl. 16—114 **9 Claims**

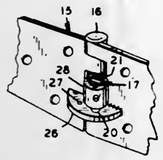


A support secured to the wall of a kitchen utensil vessel and housing a hook, and an arm with a locking notch in its free end arranged opposite the hook, the hook and the locking notch engaging respectively the shoulder and abutment of a detachable handle to secure the handle to the support.

3,579,712
DOOR HINGE WITH SPACED AUTOMATIC LATCHING POSITIONS FOR SELECTIVE DEGREES OF DOOR OPENING
Cecil R. Smith, 719 Old Orchard, Excelsior Springs, Mo. 64024
Filed Sept. 6, 1968, Ser. No. 758,002
Int. Cl. E05d *11/08*
U.S. Cl. 16—141 **2 Claims**

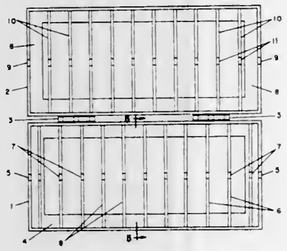
A hinge having an externally threaded sleeve spaced in parallelism with the hinge pin and containing internally;

a plug actuating a compression spring and bearing block against a ball; the sleeve having a reduced opening to per-



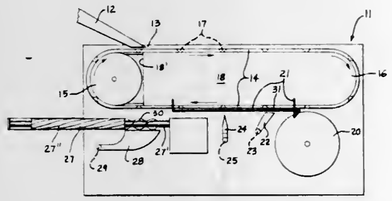
mit the ball to extend outward therefrom sufficiently to engage any of several recesses of a relatively stationary plate.

3,579,713
SKEWER MEAT DEVICE
Katherine K. H. Kang and Young Ok Kang, both of 1198 Alewa Drive, Honolulu, Hawaii 96817
Filed Sept. 2, 1969, Ser. No. 854,659
Int. Cl. A47j *43/28*
U.S. Cl. 17—1 **4 Claims**



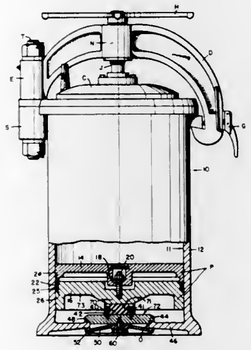
A skewer meat device which facilitates the skewering of pieces of meat by a skewer. Pieces of meat are placed lengthwise on the middle portion of one of two grids of the device. Then the device is closed to press the pieces of meat into alternate ridges and furrows. Then a skewer is inserted into the pieces of meat through a lengthwise hole in the device. Then the device is opened and the skewered meat is removed. The process is repeated as often as necessary for other pieces of meat to be skewered.

3,579,714
GIZZARD PROCESSING DEVICE
John C. Edwards, Sr., 519 Hilltop Drive, Raleigh, N.C. 27610
Filed Nov. 21, 1968, Ser. No. 777,649
Int. Cl. A22c *21/00*
U.S. Cl. 17—11 **4 Claims**



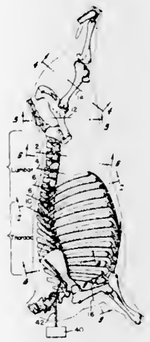
In abstract, a preferred embodiment of this invention is a gizzard cleaning machine which uses a vacuum nozzle to remove dirt from split gizzards, uses a vacuum to hold the gizzards on a conveying belt and uses a vacuum to pull the stomach gut into engagement between a pair of skinning rolls.

3,579,715
STUFFER WITH A RESILIENT CUSHIONING MEANS FOR PISTON
Carl Oscar Schmidt, Jr., Cincinnati, Ohio, assignor to The Cincinnati Butchers' Supply Company, Cincinnati, Ohio
Filed May 2, 1969, Ser. No. 821,287
Int. Cl. A22c *11/06*
U.S. Cl. 17—39 **9 Claims**



Resilient cushioning means are interposed between the adjacent faces of the piston and the manhole cover in the bottom of a conventional sausage stuffer to prevent damage to the cover from impact of the piston thereon.

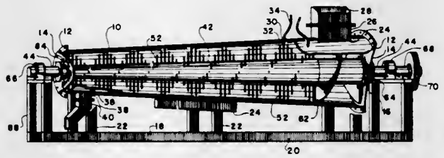
3,579,716
MEAT TENDERIZING METHOD
James R. Stouffer, Dennis R. Buege, and Wayne A. Gillis, Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.
Continuation-in-part of application Ser. No. 792,023, Jan. 17, 1969. This application Feb. 24, 1969, Ser. No. 801,483
Int. Cl. A22c *9/00*
U.S. Cl. 17—45 **21 Claims**



A method of tenderizing a selected, intact muscle contained in the carcass of a recently slaughtered meat animal where that intact muscle is connected with a portion of the bone structure of the carcass, characterized by applying tension to that muscle in a direction so that it is extended and maintained in a stretched extended condition throughout the onset, duration and completion of rigor mortis in the carcass. The invention is particularly suitable for tenderizing the edible back, front leg, rear leg and rump portions of meat animals in general, and specifically, animals of the bovine, ovine and porcine species

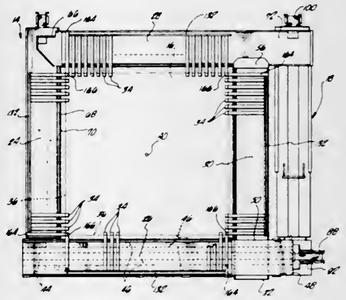
(i.e. beef, lamb and pork, respectively). Following completion of rigor mortis as aforesaid and/or additional amount of time representing the usual market handling time (i.e. 3–5 days), the treated meat will exhibit improved tenderness.

3,579,717
APPARATUS FOR PELLETIZING CARBON BLACK
Ollie Middlebrooks, Houston, Tex., assignor to Continental Carbon Company, Houston, Tex.
Filed Aug. 28, 1968, Ser. No. 755,909
Int. Cl. B29b *5/00;* **C09c** *1/58;* **B29c** *23/00*
U.S. Cl. 18—1 **11 Claims**



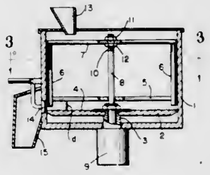
Finely divided solid carbon black is wet pelletized introducing the carbon black and the wet pelletizing liquid into a pelletizing or pelleting apparatus for mixing, agglomerating and pelletizing the black and liquid into pellet form. The pelletizing apparatus is an elongate truncated conical housing rigidly mounted with the axis being in a substantially horizontal plane. The housing has a gradually reduced diameter between its enclosed ends, accordingly being of tapered configuration. The housing has inlet means for introduction of the black and liquid near one end, and an outlet means for the discharge of pellets at the other end. An agitator means comprising a rotatable and axially mounted member having rigidly mounted pins extending from said member to about the interior of the pelletizer housing is mounted within said housing and is connected to a drive means.

3,579,718
APPARATUS FOR STRETCHING SHEET MATERIAL
Harold A. Miller, Castro Valley, William K. Nider, Orinda, and Igor P. Zavialoff, San Francisco, Calif., assignors to The Sierracin Corporation, Sylmar, Calif.
Filed Oct. 17, 1968, Ser. No. 768,368
Int. Cl. B29c *17/02;* **D06c** *3/08*
U.S. Cl. 18—1 **9 Claims**



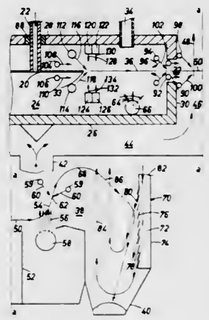
Apparatus for stretching sheet material having working beams arranged transversely to each other to define an enclosed area in which the sheet is placed. One of the beams is stationary to provide a fixed reference. Two of the beams are movable in a direction away from the center of the sheet. A fourth beam is movable along its axis to follow the stretching action. A plurality of clamps are mounted on the respective beams for gripping the sheet and connecting it with the working beams. Drive means are coupled to the movable beams to move them and subject the sheet to stretching forces. The sheet is stretched in transverse directions to increase its surface area and decrease its thickness.

3,579,719
APPARATUS AND METHOD FOR MAKING SPHERICAL GRANULES
Nobuharu Moriya, Harakata, Japan, assignor to Fuji Denki Kogyo Co., Ltd., Osaka, Japan
Filed Nov. 15, 1968, Ser. No. 776,080
Int. Cl. B29b *1/02*
U.S. Cl. 18—1 **3 Claims**



A method and apparatus for converting pasty materials into spherical granules in which extruded segments are fed into a rotating indented plate which effects a centrifugal force on the segments. The rotating segments are retained within a cylindrical wall and a plurality of vertical and horizontal blades are counter-rotated to effect an undulating rotary force on the segments, transforming them into spherical granules.

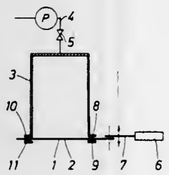
3,579,720
APPARATUS FOR SUBDIVIDING FLUID MASS INTO GRAINS
Emile Plumat, Gilly, and Jean Duthoit, Marcinelle, Belgium, assignors to Glaverbel, S.A., Watermael Boitsfort, Belgium
Filed Jan. 4, 1968, Ser. No. 695,757
Int. Cl. B22d *23/08;* **B29c** *23/00*
U.S. Cl. 18—2.5 **15 Claims**



An apparatus for subdividing a mass of material, which may be either in liquid or pasty form, into small grains by bringing the material into contact with a rotating piece so that the mass of material will be impelled from the periphery of the piece and divided into individual pieces,

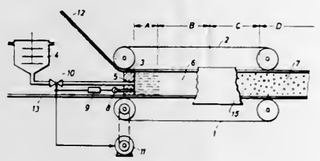
and permitting these pieces to solidify into grains as they travel through a gaseous medium, this being accomplished by submitting the particles to gaseous currents which are nonuniform along the travel paths followed by such particles.

3,579,721
APPARATUS FOR OBTAINING UNIFORM DROPLETS
Roger Max Kaltenbach, 3 Avenue Erlanger, Paris, France
Filed Oct. 18, 1968, Ser. No. 768,679
Claims priority, application Switzerland, Oct. 19, 1967, 14,648/67
Int. Cl. B29d *23/08*
U.S. Cl. 18—2.7 **14 Claims**



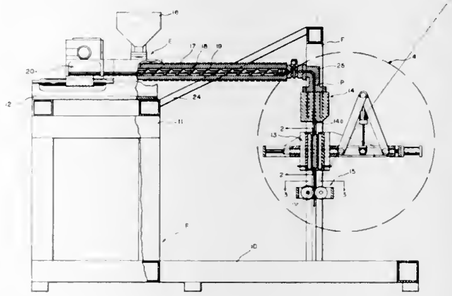
The disclosure relates to a method and apparatus for forming droplets of substantially constant size from a liquid, wherein the said liquid is passed through a perforated wall, and using vibrations to divide the liquid into droplets, the said method being characterized in that the liquid issues from the perforations in the form of laminary jets; the plate is vibrated at one of the resonance frequencies thereof; the stationary wall is maintained in one of its nodal zones so that it is continuously superposed upon the laminar flow of the periodic perturbations which divide the jets into uniform droplets. Among the applications of said method, may be mentioned the manufacture of granulated chemical fertilizers (pure or mixed urea-ammonium nitrate, calcium nitrate, complex fertilizers, etc.), but the method can be used just as advantageously in all cases where it is desired that solid granulated products should be obtained by the dispersal of a liquid, or a product which can be solidified by cooling or drying liquid droplets (as in the manufacture of shot for instance).

3,579,722
APPARATUS FOR CONTINUOUS PRODUCTION OF FOAM PLASTIC SECTIONS
Wolfgang Schmidt, Cologne, Flittard, Karl-Josef Kraft, Leverkusen, and Willi Kurth, Troisdorf, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
Filed May 22, 1968, Ser. No. 731,080
Claims priority, application Germany, June 1, 1967, F 52,569
Int. Cl. B29d *27/04*
U.S. Cl. 18—4 **5 Claims**



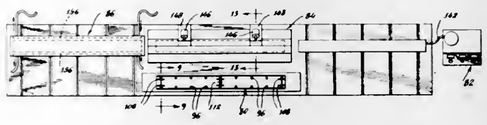
The continous production of foam plastic sections is accomplished in an apparatus comprising a double conveyor belt assembly confined at the sides by lateral side boundary members wherein the inlet aperture between the upper and lower conveyor belts and the lateral side boundaries is closed by a sealing member which has at least one supply nozzle positioned therein.

3,579,723
EXTRUDER-MOLDER
Gaylord W. Brown, Beaverton, Mich., assignor to Koehring Company, Milwaukee, Wis.
Filed July 25, 1969, Ser. No. 844,865
Int. Cl. B29c *3/04*
U.S. Cl. 18—4 **9 Claims**



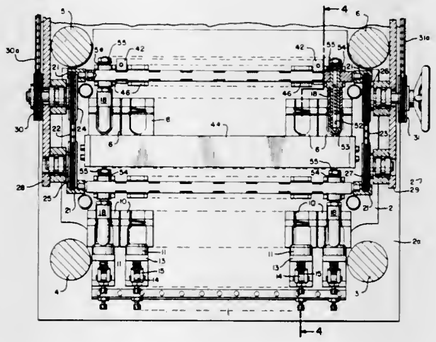
Extruding-molding apparatus wherein a sheet of synthetic plastic is directed vertically from an extruder to a differential pressure molding assembly which has molds movable into clamped relationship with the sheet. The molds are of less width than the extruding orifice of the extruding head so that a tight seal is assured and the edges of the plastic sheet are cooled at the side edges of the molds so that they may be gripped by members downstream from the mold assembly which support the weight of the sheet and prevent its tearing off, or orientation, under its own weight.

3,579,724
APPARATUS FOR THE MANUFACTURE OF COMPOSITE STRUCTURAL ELEMENTS
Louis Toth, Easton, Conn., assignor to Anchor Enterprises Corporation, Bridgeport, Conn.
Original application May 8, 1967, Ser. No. 636,866, now Patent No. 3,517,472, dated June 30, 1970. Divided and this application Sept. 19, 1969, Ser. No. 859,426
Int. Cl. B29d *3/02, 12/00;* **B29c** *27/00*
U.S. Cl. 18—4 **4 Claims**



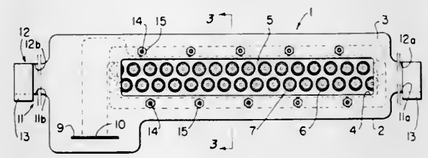
A structural element with thermal barrier means having an elongated thermal insulating plastic locking member with portions which interlock in elongated tracks formed in two elongated metal members to form a rigid unitary member.

3,579,725
MACHINE FOR PRODUCING HOLLOW ARTICLES
Benth Preben Hansen, Glostrup, Denmark, and Saul Blitz, New York, N.Y., assignors to T.W. Manufacturing Company, Inc., New York, N.Y.
Filed May 15, 1968, Ser. No. 729,224
Claims priority, application Denmark, Oct. 13, 1967, 5,080/67
Int. Cl. B29d *23/03*
U.S. Cl. 18—5 **3 Claims**



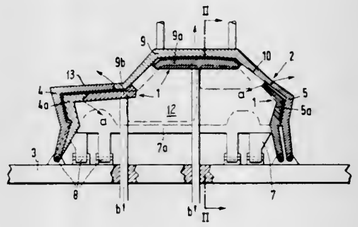
A method of molding and subsequently blow molding plastic parts in suitable molds by retaining the parts, after molding, on cores which are subsequently moved together with the parts to a position from which they are inserted into the respective blow molds for the blow molding operation and a molding machine for performing the method according to the invention. The molding machine has moving means for moving the cores between a position in which they cooperate with the injection molding means and a position in which they cooperate with the blow molding means of the machine.

3,579,726
TEMPLATE ASSEMBLY
Herbert G. Vore and Donald E. Bardsley, Nashua, N.H., assignors to Improved Machinery Inc., Nashua, N.H.
Filed July 25, 1968, Ser. No. 747,687
Int. Cl. B29c *1/00, 23/00;* **B29f** *1/10*
U.S. Cl. 18—5 **16 Claims**



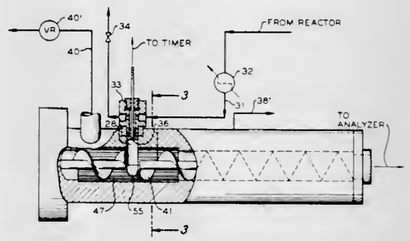
A template assembly for guiding the nozzle of a plastic molding apparatus which assembly has resiliently mounted sockets for engaging and locating the nozzle, for spacing the nozzle from the workpiece, for transmitting fluidized or plasticized and pressured plastic therethrough, to the workpiece, and for transmitting the force of the molding apparatus to the workpiece; a back-up plate providing a bearing surface for the workpiece, and for forming a rivet-type head of the molding plastic "slug" beneath the workpiece; and an alignment edge and stop for orienting the workpiece relative to the nozzle.

3,579,727
FOAM MOULD
Kurt Schwenk, Ernst Gallasch, and Hermann Hablitzel, Wolfsburg, Hannover, and Friedrich Jacob, Stelmke, Hannover, Germany, assignors to Volkswagenwerk A.G., Wolfsburg, Germany
Filed Dec. 4, 1968, Ser. No. 781,132
Claims priority, application Germany, Dec. 6, 1967, P 17 29 112.2
Int. Cl. B29d *12/00*
U.S. Cl. 18—5P **3 Claims**



A foam mould for the manufacture of the vehicle body from synthetic plastic material having a base plate with inner and outer mould halves arranged on the plate and subdivided into sections which are movable inwardly and outwardly respectively.

3,579,728
POLYMER SEPARATION
Richard K. Reid, Midwest City, and Richard O. Welty, Bartlesville, Okla., assignors to Phillips Petroleum Company
Original application July 9, 1965, Ser. No. 470,670, now Patent No. 3,506,640, dated Apr. 14, 1970. Divided and this application Dec. 5, 1969, Ser. No. 882,629
Int. Cl. B01d *11/00;* **B29f** *3/03*
U.S. Cl. 18—12 **4 Claims**

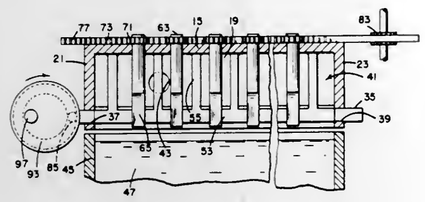


Means for passing a solution of a solid polymer directly from a reactor and flashing it into a vented extruder, analyzing the extrudate and controlling the reaction in response thereto.

3,579,729
APPARATUS FOR EXTRUDING NET-LIKE STRUCTURES
Theodore H. Fairbanks, West Chester, Pa., assignor to FMC Corporation, Philadelphia, Pa.
Filed May 16, 1969, Ser. No. 825,212
Int. Cl. B29f *3/01*
U.S. Cl. 18—12 **10 Claims**

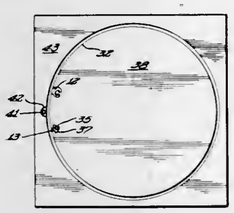
Apparatus in which flowable strand-forming material is extruded through recesses formed along opposing edges

of relatively movable plates and including means for interlacing strands formed from such streams and/or twisting



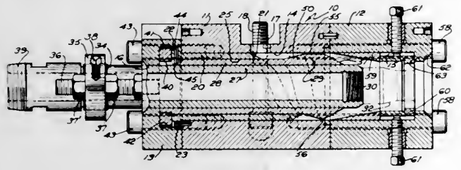
the extruded streams alternately with relative movement of the plates to provide net-like structures.

3,579,730
APPARATUS FOR MAKING A WEB HAVING INTEGRAL INTERLOCKING RIB AND GROOVE PORTIONS
Steven Ausnit, 134 E. 61st St., New York, N.Y. 10021
Original application Oct. 22, 1965, Ser. No. 500,562, now Patent No. 3,371,696, dated Mar. 5, 1968. Divided and this application Feb. 2, 1968, Ser. No. 702,586
Int. Cl. B29f *3/04*
U.S. Cl. 18—12 **10 Claims**



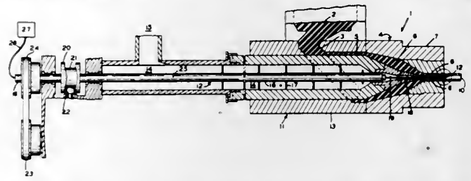
An apparatus for making reclosable bags having a first extruder channel for extruding a first thermoplastic substance and having a series of minor extrusion channels for extruding a second thermoplastic substance such that interlocking rib and groove elements of a flexible reclosable container may be formed separately, yet integrally with the film forming the closure strips or walls of the container.

3,579,731
EXTRUSION HEAD
Beresford B. Cooper, Mystic, Conn., assignor to The Entwistle Company
Filed Jan. 21, 1969, Ser. No. 792,337
Int. Cl. B29f *3/04*
U.S. Cl. 18—13 **3 Claims**



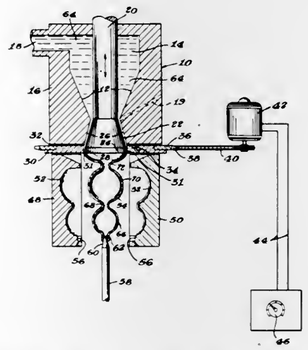
A cross head for plastic material having a guide tube with flow compensating means affixed thereto and which may be readily disassembled for cleaning.

3,579,732
DRY LUBRICANT COATING OF EXTRUDED TUBING
Earl E. Heinzelman, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed Jan. 23, 1969, Ser. No. 793,488
Int. Cl. B05b *13/06;* **B29d** *23/04*
U.S. Cl. 18—14 **2 Claims**



A dry lubricant is applied to the interior surface of an extruded tubing to assist in the placement of the tubing on piping. As the tubing is emerging from the extruder, mica powder is sprayed on the inside of the tubing. The mica powder is placed on the inside of the tubing by a rotating and reciprocating drive which reciprocates to force the powder into the interior of the tube and rotates to keep the mica powder in a nonpacked state. Air may also be supplied to the interior of the tubing to eliminate any vacuum which may be formed during the extrusion of the tube.

3,579,733
APPARATUS FOR VARIABLE PARISON FORMING
Walter H. West, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Division of application Ser. No. 615,032, Feb. 9, 1967, which is a continuation of application Ser. No. 288,863, June 17, 1963. This application Feb. 5, 1969, Ser. No. 813,358
Int. Cl. B29d *23/04*
U.S. Cl. 18—14 **2 Claims**

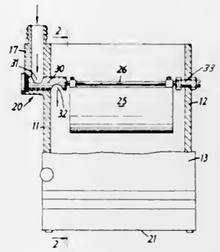


This invention relates to apparatus for controlling the diameter and thickness of an extruded plastic melt. More particularly, this invention relates to the control of parison diameter by rotation of one extruding die member in relation to another.

3,579,734
FLOAT-OPERATED LEVEL CONTROL
Maharaj K. Mehta, Cardiff, Wales, assignor to P. Leiner & Sons (Encapsulations) Limited, Treforest, Glamorganshire, Wales
Filed May 27, 1968, Ser. No. 732,201
Claims priority, application Great Britain, July 18, 1967, 32,919/67
Int. Cl. B29d *7/02*
U.S. Cl. 18—15 **4 Claims**

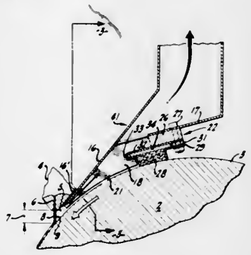
A spreader box for containing gelatine to be cast into ribbons or sheets on a casting drum including a float-

operated valve consisting of a hollow cylindrical rotary valve member and a cylindrical float parallel to the rotary axis of the valve member and connected thereto so that angular movement of the float about said axis is transmitted to the valve member. The valve member has an



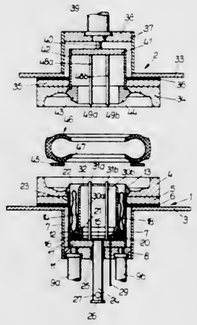
aperture in its side wall which cooperates with the end of a stationary flow passage to limit the flow of gelatine into the spreader box. The float is rotatable manually beyond a position above the rotary axis of the valve member to close the valve.

3,579,735
APPARATUS FOR BALANCING PRESSURE APPLIED TO FILM-FORMING MATERIAL IN THE DEPOSITION THEREOF ONTO A CASTING SURFACE
Peter J. Metz, Jr., Castro Valley, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.
Original application July 31, 1967, Ser. No. 657,094, now Patent No. 3,520,964, dated July 21, 1970. Divided and this application Oct. 2, 1969, Ser. No. 871,373
Int. Cl. B29d *7/02, 7/10*
U.S. Cl. 18—15R **5 Claims**



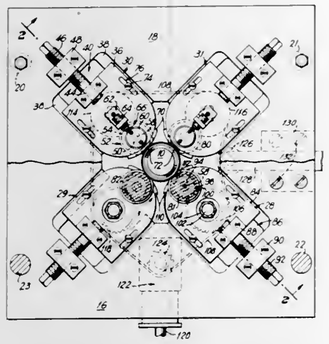
In the extrusion of film-forming material from an extrusion device wherein a vacuum is applied to the trailing face of an unsupported section continuously deposited onto a continuously moving casting surface, the pressure applied to such unsupported section is substantially balanced to cause substantially even deposit on the casting surface by concentrating application of suction by independent duct openings at the respective ends of the extrusion device to withdraw outside air which can enter behind the trailing face of said section adjacent said ends.

3,579,736
TIRE VULCANISING PRESS
Walter Balle, Dornigheim, and Gunter Pommer, Frankfurt am Main, Germany, assignors to Leonhard Herbert Maschinenfabrik, Bergen-Enkheim, Germany
Filed May 15, 1969, Ser. No. 824,879
Claims priority, application Germany, May 17, 1968, P 17 78 616.2
Int. Cl. B29h *5/02*
U.S. Cl. 18—17 **7 Claims**



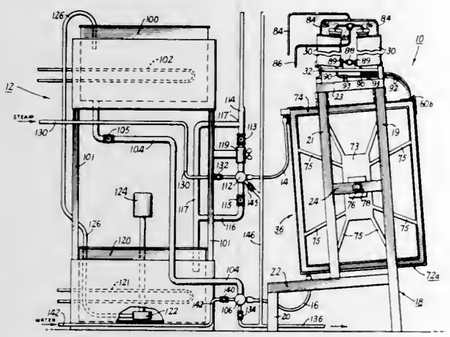
A tire vulcanising press includes a heating bag, an upper part having an upper mould half and a lower part having a lower mould half, an assembly on the lower part including an outer or ejection cylinder, an inner bag guiding cylinder within the outer cylinder, it being arranged that the bag when folded fits into the annular space between the cylinders and that the two cylinders are axiallly displaceable, a driving system for driving the outer cylinder axially whereby the inner cylinder is moved axially by the frictional force between the outer cylinder, the bag and the inner cylinder so that the bag is introduced into a tire, and a locking device for locking the inner cylinder in its raised position.

3,579,737
BRIM CURLING APPARATUS
Reinhold Gerber, Rolling Meadows; James Edward Kerrigan, Arlington Heights, and Harry Ray Hawley, Lombard, Ill., assignors to American Can Company, New York, N.Y.
Filed Oct. 15, 1968, Ser. No. 767,752
Int. Cl. B29c *17/02*
U.S. Cl. 18—19 **6 Claims**



In forming a curled turned-in lip about the open mouth of a flexible-walled, thermoplastic container, a plurality of threaded rollers engage the brim of the containers so that the faces of the thread progressively turn in the brim as the container is advanced longitudinally of the rollers. The threaded rollers are arranged to bias the brim between the faces of the threads to facilitate formation of the turned-in lip as the rollers are rotated.

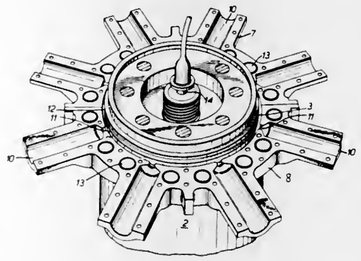
3,579,738
APPARATUS FOR CASTING AND THERMALLY CURING PLASTIC SHEETS
John O. Beattie, 57 Crawford Terrace, Riverside, Conn.
Continuation-in-part of application Ser. No. 604,242, Dec. 23, 1966, now abandoned. This application Nov. 8, 1969, Ser. No. 874,702
Int. Cl. B29c *5/00;* **B29d** *7/02*
U.S. Cl. 18—26 **8 Claims**



An apparatus for casting a plurality of plastic sheets is disclosed. It is comprised of an elevated support track having one or more temperature control cells suspended from it, the cells being enclosed chambers with inlet and outlet ports for the passage of U-shape fluid and at least one sidewall which is suitable as a mold surface of a plastic casting zone. A second mold surface is independently suspended from the elevated support track and is positioned in facing relationship with the first surface, a resilient sealing gasket between the two mold surfaces serving as an edge enclosure for a casting zone. A port in the gasket is provided for feeding casting fluid such as methyl methacrylate. Casting is carried out by applying a pressure to the exterior of the two mold surfaces thereby sealing them against the gasket, filling the casting zone, and effecting polymerization and cure by passing heated water through the temperature control cell.

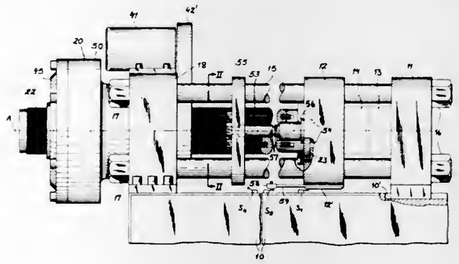
A liquid plastic feed system is mounted on the frame above the casting zones and includes a plurality of charge vessels connected to a common vacuum producing source and to a common source of liquid plastic, and manifolded to one another at their lower ends to equalize the plastic charge in each vessel. Each vessel is connected via tube to one of the casting zones.

3,579,739
APPARATUS FOR FORMING MOULDING COMPONENTS
James Edwin Henry Cosier, Northolt Park, Middlesex, England, assignor to Her Majesty's Postmaster General, London, England
Filed May 24, 1967, Ser. No. 659,247
Claims priority, application Great Britain, May 25, 1966, 23370/66
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 **4 Claims**



A method of and apparatus for sealing together certain component parts of a submarine cable repeater housing. The casing of the housing is closed by a bulkhead which is sealed to the casing by injection moulding polythene round cooperating surfaces on both casing and bulkhead. The apparatus comprises a moulding machine having several moulding cylinders each with a piston and having at least one injection nozzle.

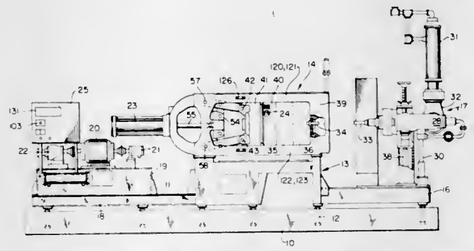
3,579,740
MECHANISM FOR CLOSING AND OPENING INJECTION MOLDS
Herbert Rees, Toronto, Canada, assignor to Husky Manufacturing and Tool Works Ltd., Toronto, Ontario, Canada
Filed Aug. 21, 1968, Ser. No. 754,181
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 **12 Claims**



The movable platen of an injection molding machine is rigid with a nonrotatable lead screw whose rear end, remote

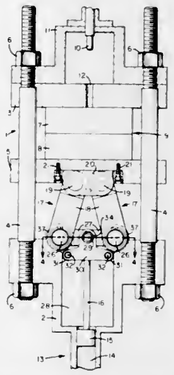
from this platen, is engaged by a rotatable drive nut at a location beyond the tie rods on which the platen slides. The machine frame, supporting the fixed platen with reference to which the movable platen is displaceable, carries a motor which can be reversibly operated to turn the nut in either direction for respectively advancing and retracting the movable platen; a cylinder at the rear of the frame carries an axially movable piston which, upon a stopping of the motor in the mold-closed position, is brought to bear under hydraulic pressure against the nut to clamp the mold between the platens against the tie bars anchored to the frame.

3,579,741
MACHINE AND CLAMP FORCE CONTROL SYSTEM THEREFOR
William H. Schwartz, University Heights, Ohio, assignor to Lester Engineering Company, Cleveland, Ohio
Filed Nov. 4, 1968, Ser. No. 773,237
Int. Cl. B29f *1/06*
U.S. Cl. 18—30 **18 Claims**



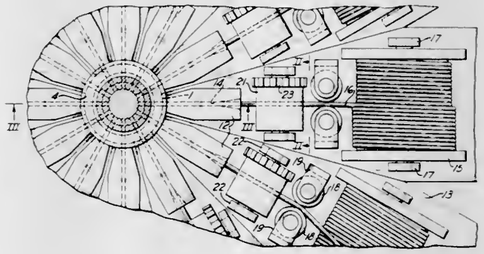
A machine such as a diecasting or injection molding machine having a frame with a bed and movable die plate supporting relatively movable molds or dies, such molds or dies being closed by a clamp cylinder to obtain a clamping tonnage, die height adjustment which is operative to control the relative position of the relatively movable dies or molds, and a control system which measures the force or tonnage exerted by the clamp and compares the measured tonnage against a preset or predetermined tonnage which then automatically energizes the die height adjustment mechanism so that the clamp tonnage will be substantially the same and correct for each cycle of operation of the machine and will not vary due to mold growth or shrinkage as temperatures change.

3,579,742
CLAMPING MECHANISM FOR MOLDING MACHINE
Vincent H. Muttart, 902 Rockaway Drive, Placentia, Calif.
Filed Dec. 5, 1968, Ser. No. 781,499
Int. Cl. B29f *1/00*
U.S. Cl. 18—30 **9 Claims**



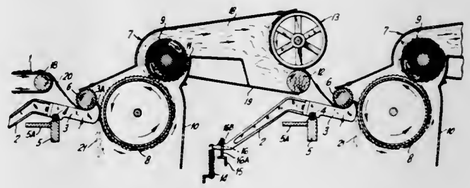
In a molding machine, a pair of toggle mechanisms, each of which includes a pair of toggle links connected between a moveable platen and a reciprocating piston. The toggle joint includes a roller which cooperates with a stationary, straight, angular wedge surface to impart a frictionless wedging action to the platen during movement of the toggle joint. A centering guide attached to the piston insures linear motion thereof.

3,579,743
APPARATUS FOR MAKING STATORS FOR ROTARY ELECTRIC SWITCHES
Mogens W. Bang, Ridgway, Pa., assignor to Stackpole Carbon Company, St. Marys, Pa.
Division of Ser. No. 698,015, Jan. 15, 1968, Pat. No. 3,538,602, filed June 30, 1970, Ser. No. 51,153
Int. Cl. B29d *3/00*
U.S. Cl. 18—36 **8 Claims**



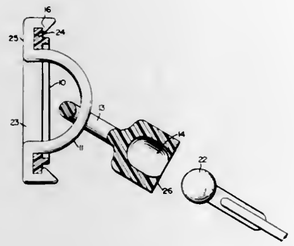
A plurality of wires are fed radially inward toward a common central point and then are stopped a predetermined distance from it. Then a rigid ring of insulating material, concentric with the same point, is molded around the wires near their inner ends, after which the wires are severed a short distance from the outside of the ring. The short lengths of wire left embedded in the ring project from the inside to form electric contact pins, and project from the outside to form electric terminals. The severing of the long wires may be done by lifting the mold, in which the wires are embedded in the insulating ring, to cut the wires where they emerge from wire-guiding means around the mold.

3,579,744
APPARATUS FOR SEPARATING FIBERS
William C. Menzies, Jr., Charlotte, N.C., assignor to Atlantic Wool Combins Co., Charlotte, N.C.
Continuation-in-part of application Ser. No. 472,974, July 19, 1965, now abandoned. This application Nov. 14, 1967, Ser. No. 687,415
Int. Cl. D01b *3/00*
U.S. Cl. 19—97.5 **1 Claim**



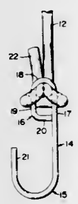
The invention relates to apparatus for separating a specialty fiber such as cashmere from its natural guard hair. The organization employs an air baffle and rotating comb and brush cylinders to create an air flow about the comb cylinder which transports the desired "down" fibers to a collecting chamber, but which rejects the undesirable guard hair.

3,579,745
FLAG FOOTBALL BELT DEVICE
Porter C. Wilson, 320 E. Elvira, Tuscon, Ariz.
Filed Mar. 24, 1969, Ser. No. 809,890
Int. Cl. A44b *21/00, 17/00*
U.S. Cl. 24—73 **5 Claims**



An improved belt mounted separable holder for displaying the flags used in playing flag football and other flag-tag games. The belt anchored portion of a male and female coupling, used to form the separable holder, is swivelly attached to the belt so as to allow free motion of the flag in any direction thereby improving the motion of the flag and then adding an element of unpredictability to play.

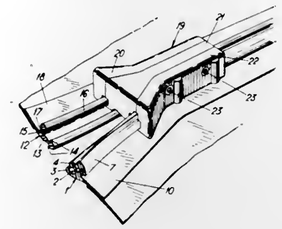
3,579,746
TIE-DOWN CLIP
James Marik, Tallmadge, Ohio, assignor to Marik Spring Inc., Summit, Ohio
Filed Feb. 20, 1969, Ser. No. 801,111
Int. Cl. F16g *11/14, 45/00*
U.S. Cl. 24—131 **3 Claims**



A tiedown clip comprising a substantially J-shaped metal member having a closed loop at its upper end is provided and is adapted to receive a pair of sections of a resilient rope in the closed loop of the metal member to secure the rope rapidly and snugly to the metal member, which metal member is normally formed from a metal wire and has all portions thereof lying in a common plane.

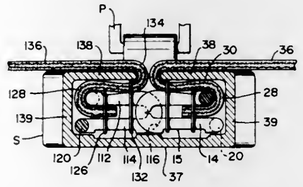
3,579,747
STRIP FASTENERS
Edwin L. Hawley, Sittingbourne, Kent, England, assignor to E.P.S. (Research & Development) Limited, Sittingbourne, Kent, England
Filed Jan. 21, 1969, Ser. No. 792,491
Claims priority, application Great Britain, Feb. 1, 1968, 5273/68
Int. Cl. A44b *19/14*
U.S. Cl. 24—201 **5 Claims**

In a slide fastener wherein a barbed rib of a male strip is arranged to interlock with a barbed jaw of a female strip, the jaw of the female strip is closed by the slider by means of a locking strut which is hinged to the female strip over one of



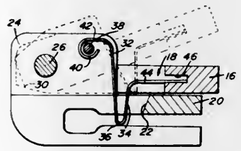
the barbed fingers which defines the jaw, the locking strut being firmly engageable by a recess in the one barbed finger.

3,579,748
SLIDE FASTENER DEVICE AND METHOD OF MAKING THE SAME
Walter V. Chery, Meadville, Pa., assignor to Textron Inc.
Filed Aug. 22, 1969, Ser. No. 852,331
Int. Cl. A44b *19/10, 19/32;* **D05b** *3/12*
U.S. Cl. 24—205.1 **11 Claims**



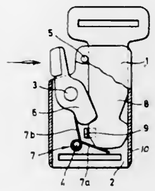
A slide fastener device having a filamentary stringer made of plastic material constructed with a series of head portions interconnected with a series of heel portions by spaced leg elements, is attached to a carrier tape by securing threads which include one set of threads passing through one portion of the tape and with a second set of threads passing through another portion of the tape.

3,579,749
ZIPPER SAFETY FASTENER
Elmer Holman, 1005 Hill St., Dallas, Oreg. 97338
Filed Oct. 28, 1969, Ser. No. 871,920
Int. Cl. A44b *19/30*
U.S. Cl. 24—205.14 **5 Claims**



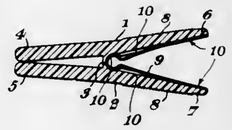
A zipper safety fastener including a toggle mounted pivotally on the slider of the zipper and a spring-type catch operatively associated with the slider and toggle and releasably engaged with the interlocking fastener elements of the zipper to automatically retain the slider in adjusted position when the toggle or handle on the slider is released.

3,579,750
LOCK FOR SAFETY BELTS
Erich Carbon, Fallersleben, and Wolfgang Wagner, Weyhausen, Germany, assignors to Volkswagen Aktiengesellschaft, Wolfsburg, Germany
Filed Oct. 10, 1969, Ser. No. 865,452
Claims priority, application Germany, Oct. 15, 1968, P 18 03 151.1
Int. Cl. A44b *11/26*
U.S. Cl. 24—230 **2 Claims**



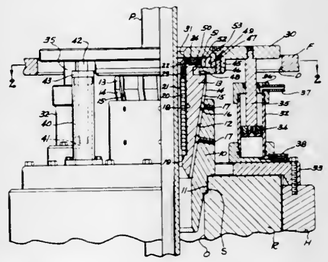
The invention relates to a lock member for safety belts having a locking link and a spring in the member with the spring composed of two portions of which one end abuts a release actuator and the other end abuts the end of the belt.

3,579,751
CLIPS USEFUL IN THE MEDICAL FIELD
Lucien Julienne Arthur Jonckheere, 88 The Gardens, Bedfont, Middlesex, England
Filed Apr. 15, 1969, Ser. No. 816,291
Claims priority, application Great Britain, May 30, 1968, 26012/68
Int. Cl. A44b *21/00;* **A61b** *17/08*
U.S. Cl. 24—252 **1 Claim**



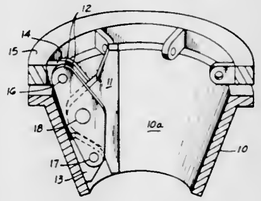
Spring clip of nontoxic plastic material for medical use consisting of an integral one-piece body having two similar rigid arms, one superimposed over the other, which are joined together intermediately by a resilient waist piece acting as a fulcrum, the adjacent pair of arm ends at one extremity being mating gripping jaws, the other pair of ends being usable for finger operation for pressing together so as to open the jaws, and a spring interposed between the finger-pressing ends to force the jaw ends together, when the finger pressure is relaxed, into a mutual gripping position.

3,579,752
AUTOMATIC ROTARY SLIPS
Cicero C. Brown, 5429 Sturbridge Drive, Houston, Tex.
Filed Apr. 9, 1970, Ser. No. 26,841
Int. Cl. F16l *7/00*
U.S. Cl. 24—263 **7 Claims**



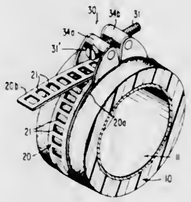
Automatic slips mountable in a rotary table for gripping and releasing drill pipe or casing being run through the table and for rotating the pipe when desired. The mechanism includes a slip spider which is raised and lowered by fluid pressure operated pistons and is held in a balanced position by telescopic supports mounted on the rotary table housing in a symmetrical arrangement about the pistons.

3,579,753
PIPE-GRIPPING APPARATUS
Dale H. Pryor, Houston, Tex., assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio
Filed Mar. 9, 1970, Ser. No. 17,778
Int. Cl. F16l *7/00*
U.S. Cl. 24—263 **7 Claims**



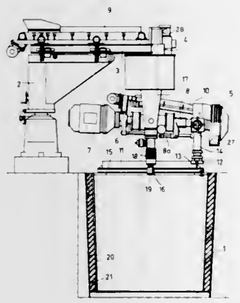
This invention relates to a new type of pipe-gripping apparatus wherein pipe-engaging slips are carried by linkage elements which are supported at one end by shoes engaging a slip bowl and at the other end by a floating ring, resulting in the frictional forces between the shoes and the bowl being less than those between the slips and the pipe so that the slips are able to retain the pipe by friction alone and without the aid of knurls, teeth, serrations, or the like on the slips.

3,579,754
COMPRESSION BAND
Hans Oetiker, Oberdorfstrasse 21, Horgen, Switzerland
Filed Apr. 1, 1969, Ser. No. 811,784
Int. Cl. B65d *63/00*
U.S. Cl. 24—279 **26 Claims**



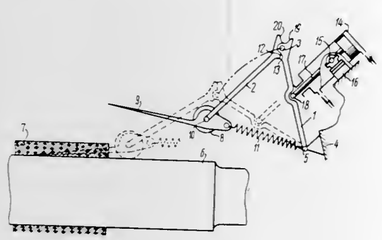
A compression band which includes a perforated band adapted to be tightened over a hoselike object by means of a closure mechanism consisting of two closure parts movable relative to one another; one end of the band is looped around one of the two closure parts while the other end of the band is threaded through openings formed in the two closure parts and is held in position by the engagement of hooks at the other closure part engaging in the perforation apertures, the closure mechanism is then tightened by means of a machine screw or the like.

3,579,755
SLINGER APPARATUS FOR LINING THE INTERIOR OF A VESSEL
Gerhard Blankenhorn, Rheinstrasse 20, Friedrichstal, and Gunter Muller, Turmbergstrasse 16, Karlsruhe-Durlach, Germany
Filed May 20, 1968, Ser. No. 730,286
Claims priority, application Germany, Oct. 4, 1967, P1,583,528.6
Int. Cl. B28b *1/00*
U.S. Cl. 25—1R **19 Claims**



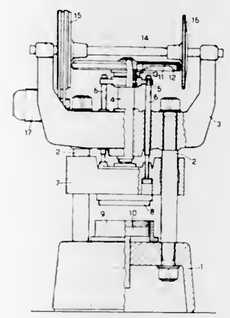
Slinger apparatus for lining the interior of a vessel. The apparatus includes a support for holding the vessel, an applicator head for slinging the material with which the vessel is to be lined, and a support for holding the applicator head, either the vessel support or the applicator head support providing a means for movably supporting the vessel or applicator head, respectively. The apparatus also includes means for producing relative motion between the applicator head and the vessel and a means having a configuration matching that of the contour of the mouth of the vessel for guiding the applicator head, during the relative movement between the applicator head and the vessel, along a path matching that of the contour of the vessel.

3,579,756
DEVICE TO FACILITATE REMOVAL OF ASBESTOS-CEMENT PIPES FROM THE MANDREL IN A PLANT FOR MANUFACTURE OF SUCH PIPES
Leonid Mikhailovich Gurevich, ulitsa Gor Kogo,5,kv.4, Moscow, U.S.S.R.
Filed May 1, 1969, Ser. No. 820,912
Int. Cl. B28b *21/42*
U.S. Cl. 25—30 **2 Claims**



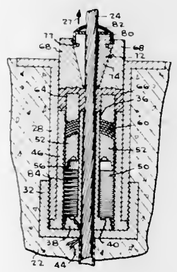
A device to facilitate removal of asbestos-cement pipes from a mandrel in a plant for manufacture of such pipes, and comprising two single-arm levers hinged to each other and to an upright. The free end of the lever which is not connected to the upright is provided with a needle, which is essentially a double-arm lever, and a roller whose axes of turning and rotation are respectively aligned one with the other. The inoperative end of the needle is connected to the joint connecting the levers with the upright through the intermediary of springs. Hinged to said upright is a power cylinder capable of turning in the plane of movement of the levers. The cylinder is hinged to a lever abutting the upright, and imparts motion to the levers. The levers moving, the roller rolls over a cam which is essentially a mandrel on which said asbestos-cement pipe is formed.

3,579,757
FLY PRESS FOR PRODUCING CERAMIC TILES
Aurelio Mingotti, Imola Bologna, Italy, assignor to S.A.C.M.I. Cooperativa Meccanici Imola Soc. Coop. A.R.L., Imola Bologna, Italy
Filed Nov. 12, 1968, Ser. No. 774,866
Claims priority, application Italy, Nov. 18, 1967, 22856A/67
Int. Cl. B28b *3/02*
U.S. Cl. 25—45 **6 Claims**



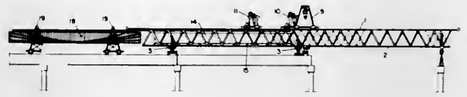
A fly press for manufacturing ceramic tiles or like articles is disclosed, which comprises an additional flywheel capable of being engaged, at the proper instant, by the usual flywheel solid with the pressing screw, so as to effect the moulding, deaerating and final compression stages as single step process.

3,579,758
EXPLOSIVE TENDON-TENSIONING MEANS
James L. Regan, Hayward, Calif. (409 Dunkel St., Fairbanks, Alas. 99701)
Filed Aug. 22, 1969, Ser. No. 852,217
Int. Cl. E04g *21/12*
U.S. Cl. 25—118T **10 Claims**



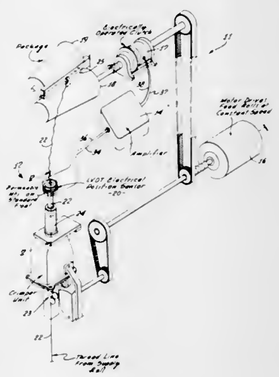
A concrete embedded barrel member in which a reinforcing tendon extends with explosive means inside the barrel for exerting a substantial tensioning force on the tendon through a cushioning member of soft metal and a plurality of apertured discs engaging the interior of the barrel so that the discs serve to retain the tendon in permanent tensioned condition.

3,579,759
TRELLIS UNIT FOR MAKING OF BEAMS
Giorgio Zuccolo, Via Arrigoni, Peraga di Vigonza, Padova, Italy
Filed Dec. 11, 1967, Ser. No. 689,631
Claims priority, application Italy, Dec. 13, 1966, 66,631/66
Int. Cl. E04g *9/10*
U.S. Cl. 25—131.6 **3 Claims**



A construction trellis unit for the formation and setting up of beams and the like in cement conglomerate, consists of a two-sided reticular framework movable longitudinally or transversely to its axis by bearing rollers. A metal form with movable walls can be slid into the framework for effecting the castings of conglomerate. When completed, the castings are lowered directly upon bridge bearings by hoists movable upon the upper booms of the trellis and prior to the withdrawal of the movable form.

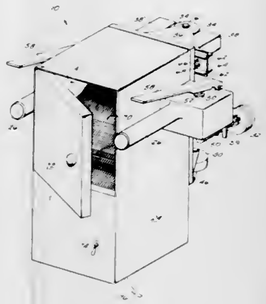
3,579,760
TEXTURIZING APPARATUS
Ralph A. Caneer; William J. Anderson; Bert B. Morgan, Asheville, and Jerry M. Goodman, Swannanoa, N.C., assignors to Northrop Carolina, Inc., Swannanoa, N.C.
Filed June 16, 1969, Ser. No. 833,602
Int. Cl. D02g *1/12*
U.S. Cl. 28—1.7 **4 Claims**



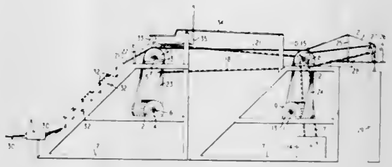
Method and apparatus useful in the textile art for maintaining the uniformity of a filament in a crimping facility in which the facility functions to continuously monitor the level of crimped material in a crimping chamber, thereby assuring a constant and predetermined level therein.

3,579,761
APPARATUS FOR YARN REMOVAL
Harvey R. Plonsker, Greenville; Reuben F. Vaughn, Seneca, S.C.; Felix C. Lang, Port Washington, Wis.; Christoph W. Aurich, Clemson, and Philip A. Bowie, Pendleton, S.C., assignors to Maremont Corporation, Chicago, Ill.
Filed Oct. 16, 1969, Ser. No. 866,909
Int. Cl. D03d *45/58*
U.S. Cl. 28—19 **10 Claims**

Yarn underwindings upon the spindles of a textile-spinning frame or like machine are removed by a portable apparatus releasably connected to the machine for guided movement longitudinally of its spindle rail. Yarn is dislodged from the spindles by a rotatable disclike member mounted for lateral and axial tilting movement, and having a smooth annular surface engageable with the rotating spindles. Dislodged yarn is withdrawn by suction into a collection chamber of the apparatus, from which it can later be readily removed. The apparatus operates with equal efficiency and effectiveness when moved in either longitudinal direction, and can be quickly connected to and disconnected from a spinning frame.

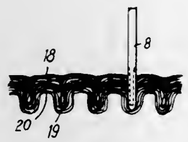


3,579,762
COLD DRAWING OF NYLON FILAMENTS
Donald I. MacKey, 33 Forest Road, and Terance Donald MacKey, R. R. 4, Galt, Ontario, Canada
Filed Dec. 27, 1968, Ser. No. 787,333
Int. Cl. D02j *1/22*
U.S. Cl. 28—71.3 **7 Claims**



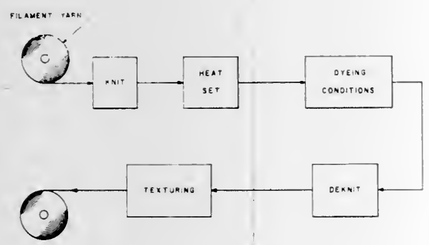
An apparatus for cold-draw stretching at least one tow of nylon filaments including a frame, first and second pairs of spaced rollers mounted for rotation transversely of said frame, said second pair of rollers being spaced from said first pair of rollers in a direction longitudinally of said frame, said rollers defining a path in which a tow of said yarn passes around said first pair of rollers in a plurality of loops and around said second pair of rollers in a plurality of loops, said loops being spaced axially along said rollers such that said tow passes to said first pair of rollers and leaves said second pair of rollers adjacent one end thereof and passes between said pair of rollers adjacent the other end thereof, said second pair of rollers being adapted to rotate at a peripheral speed higher than said first pair of rollers whereby said tow is stretched during its passage between said pairs of rollers, the axes of rotation of the rollers in each of said first and second pairs of rollers being horizontally inclined such that the point of intersection of the axes of rotation of said first pair of rollers is axially remote from the point of intersection of the axes of rotation of said second pair of rollers whereby the tow may be passed to said first and second pair of rollers at a point remote from said point of axial intersection and removed therefrom at a point adjacent said point of axial intersection with reduced bunching of said loops around said first and second pairs of rollers.

3,579,763
METHOD OF NON-WOVEN CLOTH MANUFACTURE
Francois Noel Sommer, Paris, France, assignor to Sommer S. A., Paris, France
Filed Apr. 24, 1967, Ser. No. 633,073
Claims priority, application France, Apr. 27, 1966, 59,330
Int. Cl. D04h *18/00*
U.S. Cl. 28—72.2 **14 Claims**



A process for napped surface nonwoven web of interturned continuous filaments. Stretchable filaments are employed as starting material to form a web and various of the filaments are then forced through the web surface and stretched in the process to form loops on one surface of the web.

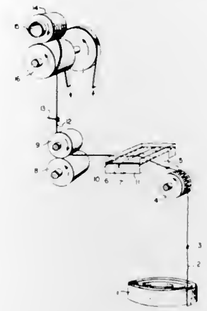
3,579,764
PROCESS FOR PRODUCING TEXTURED YARNS
William H. Kieffer, Summit, N.J., assignor to Indian Head Inc., New York, N.Y.
Continuation-in-part of application Ser. No. 758,677, Sept. 10, 1968, now abandoned. This application Feb. 26, 1969, Ser. No. 802,640
Int. Cl. D02g *1/20*
U.S. Cl. 28—72.11 **10 Claims**



A process for producing textured yarns from synthetic fiber yarns including the steps of knitting the yarn, heating the knit yarn to stabilize it prior to dyeing, dyeing the yarn, unraveling the dyed yarn and texturing the dyed yarn. The resulting yarns exhibit combinations of bulk and uniformity which are superior to those previously available commercially.

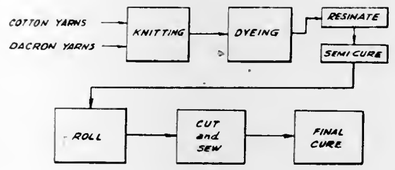
3,579,765
METHOD OF OPENING CRIMPED YARN
Jannes Eshuis, Klingelbeekseweg 11, and Horatius Tjebbes, Oude Kraan 24-Ia, Arnhem, Netherlands assignors to Algimene kunstzijde unie N.V. Arnheim, Netherlands
Filed Aug. 6, 1968, Ser. No. 750,596
Claims priority, application Netherlands, Aug. 12, 1967, 6,711,131
Int. Cl. D04b *19/00*
U.S. Cl. 28—72.16 **10 Claims**

A process for opening a crimped synthetic yarn made up of a number of filaments which comprises passing the crimped yarn through a relaxation zone in which the yarn is not under any significant tension and immediately thereafter applying a frictional force to the yarn to displace the filaments relative



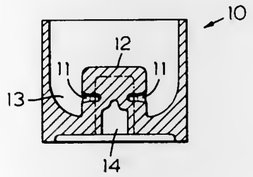
to one another and thereby open the yarn. An apparatus for carrying out this process is also disclosed.

3,579,766
PROCESS FOR MANUFACTURING PRESS-FREE, RESINATED, DOUBLE-FACE, INTERLOCK KNIT FABRIC
Emanuel M. Feinberg, 64 Genesee Blvd., Atlantic Beach, N.Y.
Filed Aug. 31, 1967, Ser. No. 664,675
Int. Cl. D06c *27/00*
U.S. Cl. 28—74 **3 Claims**



This invention relates to the process for providing a permanently shaped fabric. A resin resistant yarn and resin absorbing yarn are knitted to provide a fabric having the resin absorbing yarns on the back and the resin resistant yarns on the face. A thermosetting resin is applied to the absorbing yarns and the fabric is partially cured, thereby providing the garment fabric with the resin absorbing yarns along the inside surface thereof.

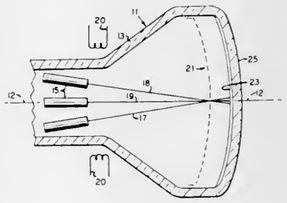
3,579,767
METHOD FOR FORMING FLASH HOLES IN CARTRIDGE CASES
Otto E. Reider, Etobicoke, Ontario, Canada, assignor to General Impact Extrusions (Manufacturing) Ltd., Toronto, Ontario, Canada
Filed June 2, 1969, Ser. No. 829,280
Int. Cl. B23p *15/22*
U.S. Cl. 29—1.3 **6 Claims**



A method of forming flash holes in cartridge shells wherein the holes are impact punched rather than drilled. It has been

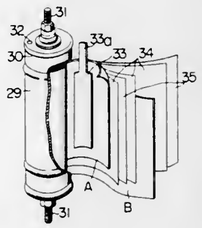
discovered that these holes can be impact punched where the shell metal has a difference of at least 5 percent between its yield strength and its ultimate tensile strength, with an attendant substantial saving in time and cost over drilling.

3,579,768
METHOD OF FABRICATING CATHODE RAY TUBE SCREEN
Glen A. Burdick, Waterloo, N.Y., assignor to Sylvania Electric Products Inc.
Division of Ser. No. 605,783, Dec. 29, 1966, Pat. No. 3,509,802, filed Aug. 19, 1969, Ser. No. 851,381
Int. Cl. H01j *9/18*
U.S. Cl. 29—25.13 **5 Claims**



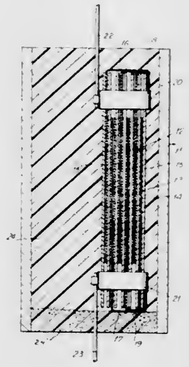
A method for providing a tri-dot patterned color cathode ray tube screen having phosphor patterns of improved symmetry. The photofabricating method involves discretely refracting light for exposing a sensitized screen panel through an associated apertured mask by utilizing a predeterminately positioned optical system. A portion of the exposure light radiation is refracted therein by a modified plano-concave lens having at least one modified plano chordal portion whereby improved exposure is provided for one or more specific peripheral quadrantal portions of the screen to effect substantially improved equilateral phosphor dot pattern formation thereon.

3,579,769
CAPACITORS AND PRODUCTION THEREOF
Akira Matsushita, 1088-312, Kitakase, Kawasaki-shi, Kanagawa-ken, Japan
Filed Feb. 19, 1969, Ser. No. 800,506
Claims priority, application Japan, Feb. 19, 1968, Feb. 19, 1968, 43/10241;43/12483
Int. Cl. H01g *13/00*
U.S. Cl. 29—25.42 **11 Claims**



Capacitors, each having a high-molecular dielectric layer electrode-positioned on at least one of two opposite electrodes thereof and having various excellent properties such as heat-resistivity, moisture-resistivity, high breakdown voltage, and high insulating resistivity, are adaptable to mass-production, miniaturization, and large capacitances. The high-molecular dielectric layer is manufactured by the method of passing a direct current on a current obtained by superposition of a direct current and an alternating current or a rectified current between a cathode and the electrode to be deposited thereon with said dielectric layer, said electrode being used as an anode, in an electrodepositing bath consisting of a resin emulsion or resin water solution containing as its main ingredient an anionic poly-high-molecular electrolytes or in an electrode positioning bath consisting of said emulsion or water solution in which a dielectric material consisting of powdery fine crystal particles or corpuscles is mixed, thereby to deposit a high-molecular dielectric layer on said anodic electrode, and subjecting said electrodeposited layer, successively, to after-treatments such as washing, drying, and polishing treatments.

3,579,770
METHOD OF FORMING TUBULAR MICA CAPACITOR
William H. O'Mara, New Bedford, and Owen J. Wood, Mattapoisett, Mass., assignors to Aerovox Corporation, New Bedford, Mass.
Division of Ser. No. 743,787, July 10, 1968, Pat. No. 3,522,493, filed Sept. 29, 1969, Ser. No. 861,824
Int. Cl. H01g *13/00*
U.S. Cl. 29—25.42 **2 Claims**

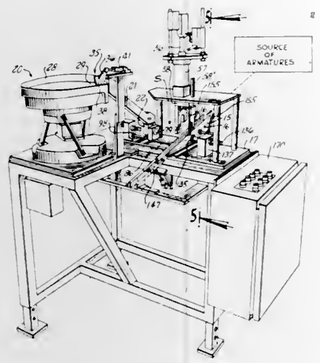


This disclosure relates to the art of electric capacitors of the mica type and more particularly relates to a method of forming a capacitor comprising a rigid tubular member of insulating material in which is positioned a substantially rectangular mica capacitor section that is retained in fixed position with terminal leads protruding from opposed ends of the tubular member by filling the latter with a thermosetting resin.

3,579,771
MACHINE FOR AUTOMATICALLY ASSEMBLING ARMATURE CORES AND COMMUTATORS THEREFOR
Thomas L. Schuette, Osseo; Melvin J. Straub, Minnetonka; Pierre Dumas, and Peter F. Aurich, Minneapolis, Minn., assignors to Possis Machine Corporation, Minneapolis, Minn.
Filed Feb. 20, 1969, Ser. No. 801,084
Int. Cl. H02k *15/02*
U.S. Cl. 29—33 **13 Claims**

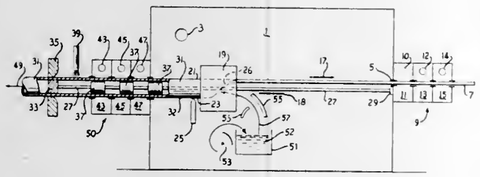
Feeding mechanism successively brings armature cores and commutators therefor to an assembly station where they are held in coaxial endwise spaced relationship and where rotation imparting mechanism brings each armature core and commutator pair into correct angular relationship. A ram then pushes the commutator axially towards the armature core with the terminal tangs on the commutator facing the core, and presses it onto the shaft thereof, moving the commutator through a die which straightens tangs that may be askew. The tank straightening die has a round hole that slideably accepts the commutator, and longitudinally extending circumferentially spaced parallel grooves that slideably accommodate the tangs. When the commutator reaches proper position on the armature shaft, and while still in the die, a tang-shaping member having circumferentially spaced

parallel fingers, one for each tang, telescopes over the commutator, each finger moving along one of the grooves to en-



gage under the tang therein and lift it into contact with the bottom of the groove.

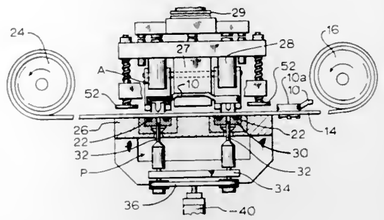
3,579,772
MANUFACTURE OF INTERIORLY COATED TUBING
Brian C. Coad, Fairfield, near Bromsgrove, Warc., England, assignor to Texas Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 605,837, Dec. 29, 1966, Pat. No. 3,457,626, filed Jan. 27, 1969, Ser. No. 852,125
Int. Cl. B23p *3/12*; **B21c** *27/08*
U.S. Cl. 29—33 **5 Claims**



This disclosure relates to continuously drawing a precleaned strip of metal past heating and evaporating means for the coating material and deforming the strip to bring the margins of the strip together to form an open-seamed, open-ended tube. The margins of the open seam are welded after the strip has been folded. The evaporated coating material enters the tube through its open end where it is being formed from strip to tube. As a result the inside surface of the tube has evaporated material condensed upon it in solid form. The condensate covers all of the inside surface, including also the welded seam. The inside-coated tube is cooled and passed through an appropriate finishing die or the like.

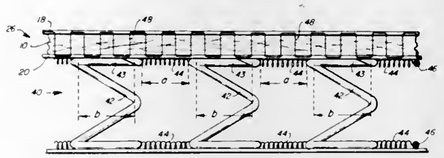
3,579,773
HANDLE ATTACHING APPARATUS AND METHOD
Milton Zysman, Toronto, Ontario, Canada, assignor to Convex Limited, Nassau, Bahamas
Filed Feb. 26, 1969, Ser. No. 802,358
Int. Cl. B68g *7/12*
U.S. Cl. 29—91 **11 Claims**

Apparatus for simultaneously attaching ventilator handles to mattress border and puncturing the border in registration with the handle vents. The apparatus comprises a bed over which border material is movable, a press movable downwardly towards the bed for attaching successive handles to the upper surface of the border and a pair of rotary cutters below the bed movable upwardly through passageways therein to puncture the border in registration with the handle



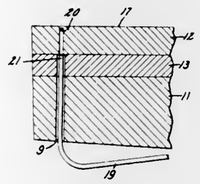
vents at approximately the same time as they are attached as aforesaid.

3,579,774
METHOD OF CONSTRUCTING A MATTRESS
Robert N. Shreve, Roseville, Minn., assignor to Conwed Corporation, St. Paul, Minn.
Filed Mar. 18, 1969, Ser. No. 808,232
Int. Cl. B68g *7/00*
U.S. Cl. 29—91.1 **14 Claims**



An extruded plastic net, having heavy strands in one direction and lighter strands in the other direction, is used to replace the two previous elements i.e. (1) a wirerope spring-bridging unit, and (2) a cotton scrim in a mattress construction thus permitting sewing of the spring-bridging unit to the cushioning material.

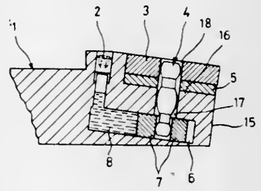
3,579,775
TOOL SURFACE TEMPERATURE MEASURING APPARATUS
Gerald J. Carlson, Scotia, N.Y., assignor to General Electric Company
Division of Ser. No. 632,621, Apr. 21, 1967, Pat. No. 3,486,378, filed Apr. 3, 1969, Ser. No. 830,168
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 **4 Claims**



Opto-electronic apparatus for hot spot temperature measurement by indirect viewing of a heated surface of a cutting tool through a small diameter hole therein which terminates close to the hot spot surface. A first end of a light guide within the hole views the radiant energy emitted from the heated end surface of the hole during a cutting operation and the remote second end directs the radiant energy to a ratio pyrometer comprising a rotating disc, two infrared filters and a first photocell. The photocell output is a series of electrical

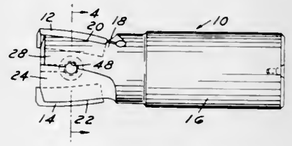
pulses of first and second amplitude representing the intensity of the radiant energy in the two spectral bands determined by the filters. Opto-electronic circuitry separates the pulses into two separate pulse trains comprising the first and second amplitude pulses, detects, and compares the peak amplitude of the pulses to obtain a ratio of pulse amplitudes. The hot spot temperature is determined from a known correlation of temperature versus pulse amplitude ratio.

3,579,776
TOOLHOLDER ASSEMBLIES
Wlajko Mihic, Tegnervagen 9, 802 28 Gavle, Sweden
Filed Nov. 18, 1968, Ser. No. 776,443
Int. Cl. B26d *1/00*
U.S. Cl. 29—96 **4 Claims**



A toolholder assembly incorporates a body which at one end has a recess for receiving an indexable cutting insert. A bore for a two-armed lever which is pivotally connected to the body extends from the recess in the toolholder body, and one end of the lever cooperates with the cutting insert, while the other end of the lever cooperates with a piston which is movable in the body. The piston is under the action of a pressure medium which is contained in a hollow space in the body and acted upon by a pressure actuating member movable into and out of the space.

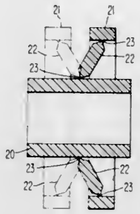
3,579,777
HELICAL END MILL
Vistor Milewski, Troy, Mich., assignor to The Valeron Corporation
Filed Mar. 10, 1969, Ser. No. 805,442
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 **8 Claims**



A cutting tool with helical slots for replaceable helix blades that fit the slots, a common kerf or slit between the blade slots which follows their helix angle and provides a bifurcated shank with opposite sides of each slot wall on opposite shank parts, and a cross screw for drawing the shank parts together to close the blade slots and hold the helix blades in the slots for metal cutting use.

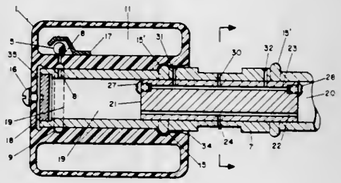
3,579,778
UNITARY BI-STABLE CODE WHEEL FOR MECHANICAL CONVEYORS AND SORTING APPARATUS
Peter T. DiPaolo, Jr., Ridley Park, and Joseph C. Carbine, Wyncote, Pa., assignors to Burroughs Corporation, Detroit, Mich.
Filed Aug. 13, 1969, Ser. No. 851,774
Int. Cl. B60b *5/02*
U.S. Cl. 29—110 **10 Claims**

This disclosure relates to a code wheel for a conveyor system such as employed in a sorting apparatus for letters and other articles. The wheel is of unitary construction and has a rim that can be translated from one to the other of two stable positions. The connecting support for the rim may be either a plurality of pivotally mounted spokes or an approximately conical web where the length of the respective spokes



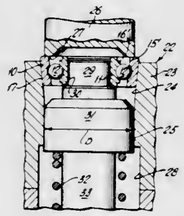
or of the conical element is greater than the difference between the rim radius and the hub radius. During translation of the rim from one stable position to the other, distortion occurs either in the rim of the spoked embodiment or in the web. Material resistance to this distortion serves to urge the rim to its nearest stable position.

3,579,779
TOP ROLLER FOR TEXTILE DRAFTING DEVICES
Marcel Stein, 560 Riverside Drive, New York, N.Y.
Filed Aug. 14, 1968, Ser. No. 752,656
Int. Cl. D01h *5/74*
U.S. Cl. 29—113 **8 Claims**



A top roller for a textile drafting device, having an interior annular space is rotatably mounted on a fixed shaft. The space is in fluid communication with an axial duct in the shaft through which a compressed medium can be passed to inflate the roller. Compressed air supplied to a second axial duct in the shaft blows off dirt that may accumulate on the end of the roller.

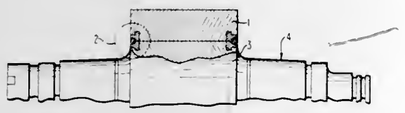
3,579,780
METHOD OF MAKING A BEARING HAVING A FULL COMPLEMENT OF BALLS
Richard J. Matt, Simsbury, and Ronald E. Restelli, Cromwell, Conn., assignors to Textron Incorporated, Providence, R.I.
Filed Sept. 9, 1968, Ser. No. 758,358
Int. Cl. B23p *11/00, 11/02*; **B23b** *19/00*
U.S. Cl. 29—148.4 **16 Claims**



A bearing having a full complement of balls is described wherein an outer ring is made of a wrought heat-resistant alloy and provided with a depth-of-track to ball-diameter

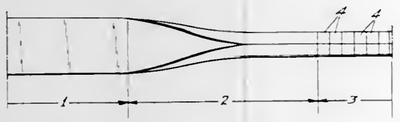
ratio of at least 1 : 10. Cobalt base and nickel base alloys or a combination thereof have been found to be particularly useful with this type of bearing. A method of making the bearing includes preassembling a bearing structure by placing a thermally expanded conical outer ring over an assembly comprising an inner ring and a full complement of balls within the inner ring face. Subsequently, the conical outer ring is compressed to bring a tapered portion thereof towards the balls and produce the desired depth-of-track to ball-diameter ratio with final radial clearance and fit. A particular selection of component parameters is described for the manufacture of the device.

3,579,781
SLEEVED ROLL AND METHOD OF MAKING THE SAME
Toshio Yaegashi, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo-To, Japan
Filed July 24, 1968, Ser. No. 747,153
Claims priority, application Japan, July 27, 1967, 43/64862
Int. Cl. B23p *11/00, 11/02*
U.S. Cl. 29—148.4 **20 Claims**



A sleeved roll which comprises a sleeve and an arbor fitted in the sleeve by means of shrink fitting wherein the arbor and the sleeve are, respectively, provided at the opposed end portions thereof with annular grooves into which metal rings having good welding characteristics are tightly fitted, respectively, in such a manner that the metal rings in the sleeve combine with those in the arbor to form a U-shaped annular ring when they are firmly secured to each other by means of deposit metal which has a smooth surface, the radial section of the grooves and the united metal rings having such a contour as to withstand slip between the sleeve and the arbor.

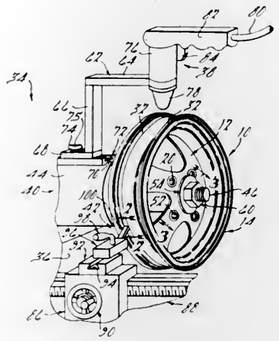
3,579,782
METHOD OF MANUFACTURING ROLLING BEARING COMPONENTS
Stig Lennart Hallerback, Blodboksgatan 12, Vastra Frolunda, Sweden
Filed Aug. 2, 1968, Ser. No. 749,783
Int. Cl. B23p *11/00, 17/00*
U.S. Cl. 29—148.4 **6 Claims**



A method of manufacturing rolling bearing components consisting of the steps of forming a tubular member by bending up a flat sheet and joining the sheet at confronting edges, separating the tubular member into a plurality of annular rings, and simultaneously rolling and bending at least one flange at one end of said annular ring at grooved portions formed by rolling.

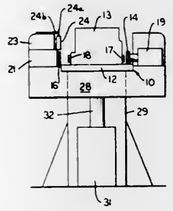
3,579,783
METHOD FOR MANUFACTURING WHEELS
Edward J. Hayes, Ann Arbor, and Stephen E. Crick, Livonia, Mich., assignors to Kelsey-Hayes Company, Romulus, Mich.
Filed July 5, 1968, Ser. No. 742,590
Int. Cl. B21d *53/26;* **B21k** *1/28, 1/42*
U.S. Cl. 29—159 **26 Claims**

A method and apparatus for manufacturing vehicle wheels wherein a structural adhesive material is applied to the rim bead seat section of the wheel rim while simultaneously rotating the wheel about its axis of rotation, the material being distributed over the bead seat section by means of a suitable tool disposed adjacent the wheel and adapted to en-



gage the material upon rotation of the wheel, whereby the material forms a surface of constant radius from the rotational axis of the wheel and upon which an associated vehicle tire is adapted to be mounted.

3,579,784
ENGINE BLOCK STRIPPING APPARATUS
George R. Klempner, and Sam Rosenberg, Louisville, Ky., assignors to Foundry Suppliers, Inc., Louisville, Ky.
Filed Feb. 24, 1969, Ser. No. 801,668
Int. Cl. B23p *19/00;* **B26f** *3/00*
U.S. Cl. 29—200 **3 Claims**

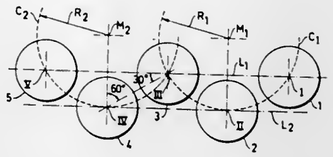


Disclosed is an apparatus in which movable elements engage opposite ends of, and rigidly hold, the crankshaft of a junked engine block, subsequently, an additional movable portion of the apparatus applies a force to one end of the engine block parallel to and above the crankshaft to fracture the engine block portions carrying the main crankshaft bearings. Finally, the movable elements holding the crankshaft are dropped or lowered to extract and separate the crankshaft, rods and pistons from the engine block.

3,579,785
APPARATUS FOR UNITING A PLURALITY OF FIRST OBJECTS WITH A CORRESPONDING NUMBER OF SECOND OBJECTS
Lars Ingvar Hellborg, Lund, Sweden, assignor to Sobrefina S.A., Fribourg, Switzerland
Filed Apr. 8, 1969, Ser. No. 814,249
Claims priority, application Sweden, May 12, 1966, 6504/66
Int. Cl. B23p *19/00, 19/04*
U.S. Cl. 29—200 **4 Claims**

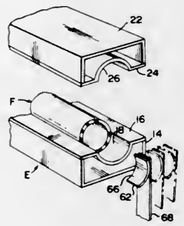
Apparatus for uniting a plurality of container bodies with outer sleeves comprises a pair of parallel spaced rotationally mounted members having pockets which receive the sleeves. The pocketed members are rotated in a step-by-step manner so as to simultaneously advance the sleeves into a spacial

configuration wherein the centers of the sleeves are located in longitudinal spaced relation along two parallel straight lines. A rotationally mounted multisided turret also rotatable in a step-by-step manner includes along each side thereof a like number of holders having the same spacial configuration



as that of the sleeves, plungers transfer the sleeves from their pockets to the holders, and the container bodies arranged with the same spacial configuration as the sleeves are then inserted in the sleeves after the sleeves have been transferred to the holders on the turret.

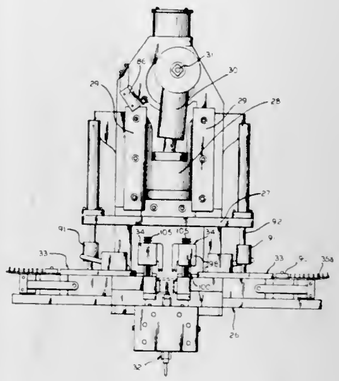
3,579,786
HOSE STRAIGHTENING DEVICE
Theodore C. Johnson, 6011 Briardall Lane, Solon, Ohio
Filed Apr. 23, 1969, Ser. No. 818,749
Int. Cl. B23p *19/00, 19/02*
U.S. Cl. 29—200 **8 Claims**



A device for holding straight a short length of normally curved semirigid hose while metal fittings of an external diameter greater than the internal diameter of the hose are forced into the ends of the hose. The device consists of a pair of clamping members somewhat shorter than the hose arranged to clamp the central portions of the hose straight, in combination with a pair of supporting fingers at opposite ends of the clamping members. The fingers are biased in a direction to straighten the ends of the hose projecting beyond the clamping members, the fingers being yieldingly supported to allow expansion of the hose ends as the fittings are forced thereinto.

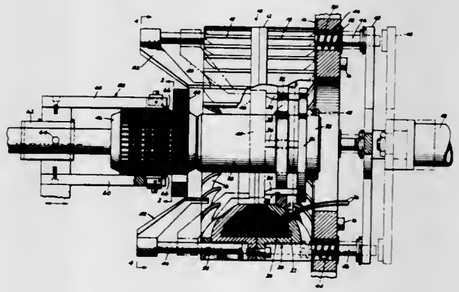
3,579,787
MACHINE FOR APPLYING LUGS OR THE LIKE TO BOBBINS OR THE LIKE
Joseph J. Cervenka, 428 E. Crescent, Elmhurst, Ill., and Marvin E. Hetzel, 177 Michaux Road, Riverside, Ill.
Filed Sept. 17, 1968, Ser. No. 760,267
Int. Cl. H05k *13/04;* **B23p** *19/04*
U.S. Cl. 29—203 **9 Claims**

Machine for applying lugs or the like to plastic bobbins or the like when the bobbins include post means and the lugs include hole means matable with the post means and collapsible means coacting with the hole means to decrease the size of the hole means and lock the lug to the bobbin, and the machine includes means feeding lugs into alignment with bobbins at a lug-applying station, means severing lugs from a strip form of lugs, means applying the lugs to the bobbins,



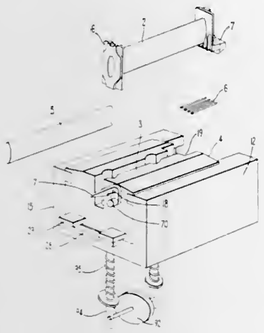
and means collapsing the lug collapsible means to secure the lug to the bobbin.

3,579,788
APPARATUS FOR COMPRESSING LAMINATED CORES
Harold L. Fritzsche, Fort Wayne, Ind., assignor to General Electric Company
Filed Feb. 27, 1969, Ser. No. 802,861
Int. Cl. H02k *15/00*
U.S. Cl. 29—205 **6 Claims**



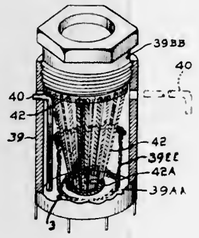
An assembly for compressing laminated articles, such as stator cores for dynamoelectric machines. There is provided an assembly including a doughnut-shaped electromagnet and a tapered nonmagnetic plug mounted within the electromagnet. A core, previously coated with a material intermixed with magnetic particles, is slipped over the plug and moved by suitable mechanical means toward the center of the electromagnet while the electromagnet is energized. The resultant magnetic field attracts the core to the center of the electromagnet. Also mounted in the assembly are spring-biased clamps which cooperate with adjustable stop members for clamping the core therebetween, thereby mechanically compressing the laminations of the core together. The magnetic field produced by the electromagnet magnetically compresses the laminations and also draws the coating material intermixed with magnetic particles to selected surfaces of the core, thereby forming an increased thickness of material on those surfaces.

3,579,789
MACHINE FOR THE MANUFACTURE OF RELAY COIL BOBBINS
Lucien Ernest Grente, and Roger Leveque, Boulogne, France, assignors to International Standard Electric Corporation, New York, N.Y.
Filed Aug. 1, 1969, Ser. No. 847,535
Int. Cl. H01r *43/00*
U.S. Cl. 29—203D **9 Claims**



A machine is provided for manufacturing electromagnetic relays. Bare relay bobbins are introduced into the machine and these bobbins are then equipped with magnetic cores and connection prongs. Thereafter, the finished relays are ejected from the machine.

3,579,790
DEVICES AND ACCESSORIES FOR ELECTRIC ARMORED CABLES AND STUFFING TUBES
Paul M. D'Amico, 2709 S. 12th St., Philadelphia, Pa.
Division of Ser. No. 502,048, Oct. 22, 1965, abandoned, filed Oct. 31, 1958, Ser. No. 772,179
Int. Cl. H05k *13/00*
U.S. Cl. 29—203 **3 Claims**

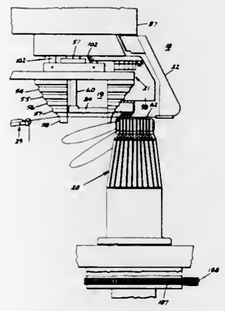


Devices and accessories in the form of tool means and associated equipment for the installing and servicing, including emergencywise preparation, of electric armored cables, in the form of a circular T-w wrench, a safety shield with accurate cutter grooves in a combined ring-cutter, which limits the depth in cutting the outer interstices of shielding or layers of insulation if required, and said devices also may be affixed and grouped into a piece unit for storing and ever-ready utility.

3,579,791
COIL DEVELOPING APPARATUS
Richard B. Arnold, Fort Wayne, Ind., assignor to General Electric Company
Continuation-in-part of application Ser. No. 748,406, July 29, 1968. This application Dec. 11, 1969, Ser. No. 884,145
Int. Cl. H02k *15/00*
U.S. Cl. 29—205 **13 Claims**

Apparatus for developing one or more coil groups of electrically conductive wire. The apparatus includes a coil turn-forming assembly having a jump form portion and a snap out form portion. The jump form portion includes a plurality of turn-gauging steps with an interruption formed at one side. The snap out form portion is supported adjacent to the interruptions on the turn-gauging steps and includes a corresponding number of snap out winding form plates, each having a fill-in winding section for spanning one of the associated interruptions on the jump form portion.

The apparatus also includes a flyer for placing wire on the coil turn-forming assembly to generate turns and a jump means for locating a turn-gauging step of the jump form portion in the path of the wire being wound by the flyer. Concurrently, as the jump means locates a turn-gauging step in the path of the wire wound by the flyer, a snap out plate is extended to place a fill-in winding section in alignment with its associated interruption of a turn-gauging step. The turn-gauging step of the jump form portion and its associated fill-in winding section cooperate to provide a form for winding or generating turns of a predetermined length for receipt in a coil group accommodating means or device. Preferably, the coil group accommodating means is comprised of spaced curved blades defining turn receiving slots. The spaced



curved blades and corresponding fill-in winding sections of the snap out plates have associated mating curved surfaces whereby, when a snap out plate is engaged with a curved blade, the entry of the turns of a coil being generated into the corresponding turn receiving slot is facilitated by the mating curved surfaces. Thus each coil is developed directly in the coil group accommodating means as the turns for the coil are generated about the coil turn-forming assembly. Also, the jump form portion and the snap out plates may be supported for movement in essentially a vertical direction, and the curved blades are supported in alignment with the snap-out plates so that the force of gravity facilitates the removal of the turns from the coil form assembly.

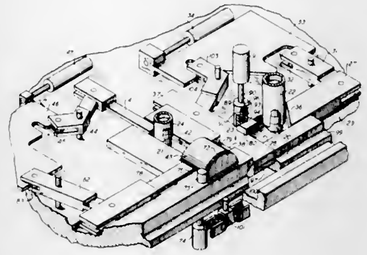
Additionally at least part of the jump form portion is movable relative to the snap out portion during the turn-generating operation for selectively varying the lengths of successive turns.

A coil group is developed in the coil group accommodating means by producing a plurality of serially connected wound coils of a coil group in the coil group accommodating means. Thereafter the coil group may be inserted directly from the coil group accommodating means into preselected slots of a stator core.

3,579,792
APPARATUS FOR ASSEMBLING PIECEPARTS INTO CUP-SHAPED ADAPTERS
Edward H. Craver, Clemmons, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.
Filed Sept. 30, 1969, Ser. No. 862,235
Int. Cl. B23p *19/04;* **B23q** *7/10*
U.S. Cl. 29—208 **7 Claims**

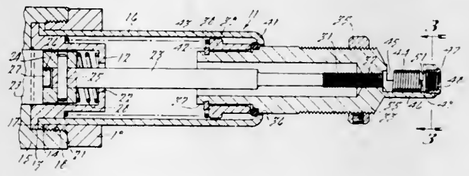
A loading apparatus assembles a ferrite core into a cup-shaped adapter. First the adapter is pushed to an assembly station to receive the ferrite core where it is accurately positioned by a slanted end of a pusher and a corner. The ferrite core is then pushed to the assembly station where it is held between a pusher and a spring-biased member in an elevated

position over the adapter. The cores are fed from a stack where a pronged member gently lowers the stack after a pusher has retracted. A spring-biased plunger at the assembly station pushes the ferrite core down into the adapter. A



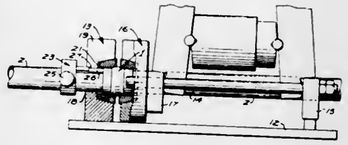
switch on the plunger senses any failure of the ferrite core to assemble into the adapter to release an ejection mechanism to drop the unassembled ferrite core and adapter from the assembly station.

3,579,793
POWER TOOL FOR THREAD INSERTS
Charles A. Williams, Highland, Mich., and Richard E. Waller, Erie, Pa., assignors to Microdot Inc., Greenwich, Conn.
Filed Sept. 24, 1968, Ser. No. 761,979
Int. Cl. B23p *19/04*
U.S. Cl. 29—240.5 **11 Claims**



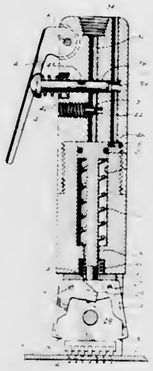
The power tool has a shaft which engages and advances an insert into an aperture of a workpiece in one direction of rotation and screws the threaded end of the shaft from the insert in the other direction of rotation. The distance of advancement of the insert and the threaded aperture of the workpiece is controlled by a stop collar that is adjustable on the exterior of the tool for causing cam means to interrupt the drive of the shaft when the insert has been advanced a required distance.

3,579,794
MEANS FOR SECURING COUPLINGS TO PIPE
Jonathan S. Powell, 11 W. State St., Pasadena, Calif.
Division of Ser. No. 678,932, Oct. 30, 1967, Pat. No. 3,477,750, filed Oct. 3, 1969, Ser. No. 863,511
Int. Cl. B23p *19/04*
U.S. Cl. 29—237 **2 Claims**



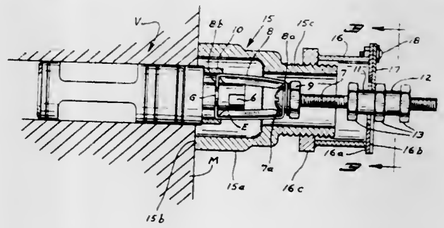
A means and method of constricting a coupling having internal teeth onto a pair of abutting pipe sections; the means comprising an assembly of split rings which may be secured around a pair of abutting pipe sections and a coupling having internal teeth initially slidable on the pipe sections, at least one of the rings containing a constricting die adapted, when forced axially over the coupling, to constrict the coupling and force the teeth into the pipe sections; a hydraulic ram being placed between a pair of rings to effect relative movement of the die and coupling and thus constrict the coupling. One embodiment involves a pair of constricting dies movable toward each other and another involving a single die and a sleeve for forcing the coupling through the die.

3,579,795
COMPONENT REMOVING TOOL
Per Aron Burman, Temple City, Calif., assignor to Burroughs Corporation, Detroit, Mich.
Filed Aug. 8, 1969, Ser. No. 848,545
Int. Cl. B23p *19/04*
U.S. Cl. 29—252 **17 Claims**



A power augmented handtool particularly useful for removing integrated circuit components from a printed circuit board is described. The tool has a body in which a plunger is movable between an extended and a retracted position. A pair of opposed, component gripping, jaws are pivotally connected to the plunger at the nose end of the tool. When the plunger is in the retracted position, the jaws are positively cammed open. While the plunger travels toward the extended position, the jaws are resiliently biased open. When the plunger is in the extended position, the jaws are positively cammed to a closed position to grip a circuit board component. A relatively strong spring biases the plunger toward the retracted position so that when the solder holding a component to a printed circuit board is melted, the jaws draw the component away from the board. The component is released when the jaws are cammed open when the plunger reaches the retracted position. Either compressed air pressure or a mechanical arrangement may be employed for extending the plunger and jaws.

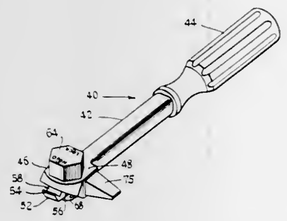
3,579,796
PULLER DEVICE FOR GENERALLY CYLINDRICAL STEM ASSEMBLIES OR VALVES
Walter A. Fillion, 705 2nd St. N.E., Minneapolis, Minn.
Filed Aug. 19, 1969, Ser. No. 851,223
Int. Cl. B23p *19/04*
U.S. Cl. 29—263 **5 Claims**



A puller device for longitudinally extracting generally cylindrical valve assemblies and the like and which have a

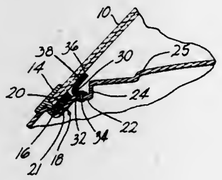
slightly protruding outer end provided with a circumferential indentation. The improved device combines the use of an elongated puller shaft having means at the inner end for grasping and interlocking with said circumferential indentation, together with an annular abutment member surrounding the inner portion of the stem and having an end for abutment against the mounting of said cylindrical assembly, and a second cooperating puller nut also surrounding said stem and disposed outwardly of the first annular member and having extended threaded interconnection therewith. The combination further requires a shiftable lock device carried by the annular puller member for selective engagement with two diminished collars or grooves provided intermediately of the elongated stem. The outer annular puller element is screw threaded inwardly against the abutment member then interlocked with one of the collars of said stem and, in operation, is screwed outwardly with powerful force to pull the stem outwardly through the first abutment member.

3,579,797
TOOL FOR REMOVING CONCENTRIC KNOCKOUTS
Frank W. Pepe, 637 Prospect Drive, Lordship, Conn.
Filed Feb. 20, 1968, Ser. No. 706,899
Int. Cl. B23p *19/04*
U.S. Cl. 29—267 **13 Claims**



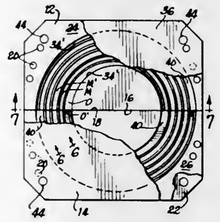
A tool for removing concentric ring knockouts from electric wire junction and terminal boxes, etc., after removal of the center disc knockout. The tool has opposed groove defining gripping means set at an acute angle relative to each other which engage opposite points on the ring knockout so as to fracture the knockout by a back and forth movement of the tool until the points of connection of the ring knockout with the rest of the box fracture.

3,579,798
METHOD OF VERIFYING THE REPLACEMENT OF A DAMAGED WINDSHIELD
William P. Henderson, 1109 Crayton Road, Naples, Fla.
Filed Feb. 13, 1969, Ser. No. 799,027
Int. Cl. B23p *7/00*
U.S. Cl. 29—401 **12 Claims**



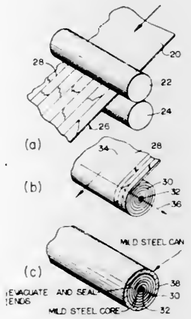
Replacement of a damaged windshield on a motor vehicle or the like is verified by removing the damaged windshield to obtain access to an identification serial number of the vehicle located immediately adjacent the windshield and then taking an impression of the vehicle serial number before installing a new replacement windshield. The impression is taken on a label which is then attached to a statement which is forwarded to an insurance company for payment. Verification of the type of replacement windshield installed is also obtained by removing a manufacturer's label from the replacement windshield and attaching the manufacturer's label to the label bearing the impression.

3,579,799
METHOD OF MAKING A GROOVED MOLD
Alvin J. Furstenburg, Chicago, and Edmund J. Kujawa, Wilmette, Ill., assignors to Felt Products Mfg. Co.
Division of Ser. No. 542,343, Apr. 13, 1966, Pat. No. 3,406,430, filed Apr. 10, 1968, Ser. No. 745,056
Int. Cl. B23p *17/00;* **B29c** *1/02*
U.S. Cl. 29—416 **9 Claims**



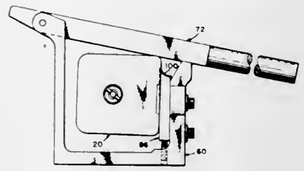
This invention deals with a method for producing a mold member having a plurality of helical molding grooves. Endless grooves are formed on the surface of a mold blank which is then divided along a line which intersects each endless groove twice. The divided mold blank segments are then aligned in such a way as to define a plurality of helical grooves.

3,579,800
PRODUCTION OF ELONGATED EXTRUSIONS COMPOSED OF TITANIUM BASE METAL
Robert F. Packard, Brookline, Mass., assignor to Technical Metals, Inc., Brockton, Mass.
Filed Jan. 28, 1969, Ser. No. 794,647
Int. Cl. B23p *17/00*
U.S. Cl. 29—423 **10 Claims**



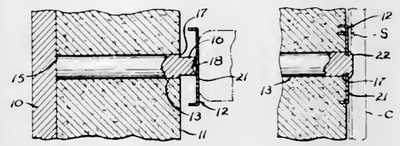
Elongated extrusions of titanium base metal are produced from billets in the form of coils of titanium base metal. In such a coil, the rolling direction of the sheet and the axis of the convolutions of the sheet are at right angles to each other. It is believed that striated roughness of the resulting extrusion is minimized because grain elongation in the rolling direction and grain elongation in the extruding (axial) direction are such that strain hardening is neutralized.

3,579,801
OPENER FOR A FILM PACK
Frank Y. Ishihara, Seattle, Wash., assignor to Leonard H. Tall, Mercer Island, Wash., fractional part interest
Filed Apr. 1, 1968, Ser. No. 717,636
Int. Cl. B23p *19/04;* **B67b** *7/30;* **B25b** *27/14*
U.S. Cl. 29—427 **5 Claims**



This invention is directed to a method and an apparatus for opening a film pack so as to easily and quickly remove the film from the film pack. It is necessary to remove the film from the film pack without damaging the film such as by scratching the undeveloped film or by tearing in two the undeveloped film or by allowing the film to become unraveled from the film pack and generally mixed. I have approached this problem from the standpoint of enlarging the opening in the film pack so that the undeveloped film can be removed from the film pack without substantially touching any of the body of the container of the film pack around the opening.

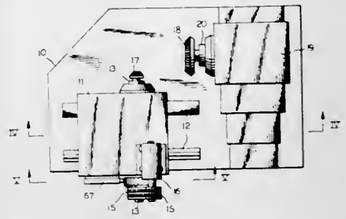
3,579,802
METHOD FOR INSULATING BOILER OR LIKE HOUSING WALL
Frank R. Gajovski, 4112 Swain Drive, Barberton, Ohio
Filed Dec. 2, 1968, Ser. No. 780,322
Int. Cl. B23p *11/00*
U.S. Cl. 29—432.2 **5 Claims**



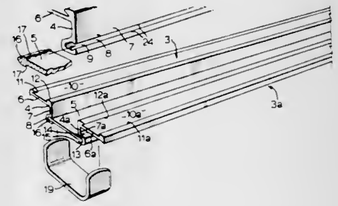
Method and means for securing thin-webbed metalwork on boiler or like housing wall, as for retaining insulation and/or finishing sheeting thereon. Studs may have inner ends welded to housing wall by use of a stud welder. Areas of metalwork strip impacted against reduced ends of studs to punch through web, and further impaction forms heads to retain metalwork against peripheral shoulders defined by reduced ends.

3,579,803
METHOD FOR BRINGING TWO STATIONARY GEARWHEELS INTO ENGAGEMENT WITH ONE ANOTHER ON A LAPPING OR TESTING MACHINE
Alfred Johann Lautenschlager, Zurich, Switzerland, assignor to Oerlikon-Buhrle Holding AG, Zurich, Switzerland
Division of Ser. No. 612,378, Jan. 30, 1967, Pat. No. 3,403,569, filed June 13, 1968, Ser. No. 737,789
Int. Cl. B23p *19/00*
U.S. Cl. 29—434 **9 Claims**

A method for bringing into engagement two gearwheels on a lapping or testing machine. The gearwheels are displaced towards one another until they come into mutual contact and in the event of the tips of two teeth contacting one gearwheel is rotated through a fraction of the tooth pitch and engagement of the two gearwheels is prevented until a tooth of one gearwheel is opposite a gap in the other gearwheel.

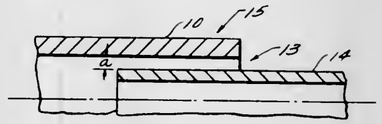


3,579,804
METHOD OF MAKING LUGGAGE CASES
Jack Slan, Toronto, Ontario, Canada, assignor to Dominion Luggage Co. Limited
Filed Nov. 19, 1968, Ser. No. 784,510
Int. Cl. B23p *19/00, 9/00*
U.S. Cl. 29—434 **9 Claims**



The method of obtaining an accurate interlock between opposing case sections by clamping two edge strips and a tongue strip which are to make up the confronting edges of the case sections in interfitting relation prior to bending, then bending the strips while clamped to effect matched bends and at the same time a permanent locking of the tongue strip in one of the edge strips and matched interfit with the other edge strip. A luggage case is produced by such a method of manufacture.

3,579,805
METHOD OF FORMING INTERFERENCE FITS BY HEAT TREATMENT
Howard Berdolt Kast, Fairfield, Ohio, assignor to General Electric Company
Filed July 5, 1968, Ser. No. 742,882
Int. Cl. B23p *11/02*
U.S. Cl. 29—447 **10 Claims**

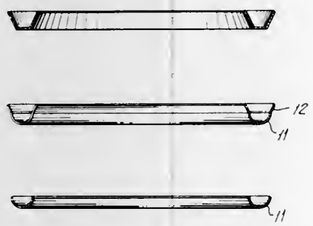


An interference fit can be provided between metal components where at least one of the components is formed of a precipitation-hardenable metal alloy which undergoes a substantially permanent dimensional change in addition to a reversible dimensional change upon heat treatment at elevated temperatures. The interference fit itself will be irreversible if both components are formed of the precipitation-hardenable alloy and reversible if only one of the components is formed of the alloy.

3,579,806
METHOD OF PRODUCING TOROIDAL BODIES FROM HARD, BRITTLE STEELS

Gerard Huberdeau, Atelier de Construction de Tarbes, France, assignor to French State represented by the Minister of Armed Forces Ministerial Delegation of Weapons, Technical Delegation of Land Weapons Manufacturing Workshops of Tarbes, Paris, France

Filed June 19, 1969, Ser. No. 834,632
Claims priority, application France, June 19, 1968, 155,597
Int. Cl. B21d *39/02*
U.S. Cl. 29—463 **10 Claims**

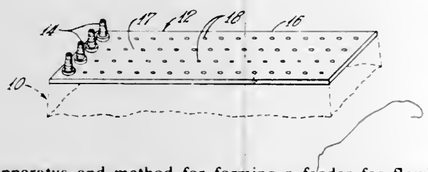


A toroidal body of hard, brittle material is produced by joining two semicircular toroidal bodies in face-to-face relation, each semicircular toroidal body being formed from a ring of material by first spin forming the ring in two steps to produce a U-shape peripheral portion on the ring, thereafter machining the peripheral portion to provide uniform thickness and then heat treating the body and hot stamping the same to form semicircular portions on said peripheral portions which are separated from the remainder of the body by machining.

3,579,807
METHOD AND APPARATUS FOR PRODUCING A STREAM FEEDER

Leonard A. Matulewicz, 931 Continental Blvd., Toledo, Ohio

Filed May 29, 1968, Ser. No. 733,040
Int. Cl. B23k *31/02*
U.S. Cl. 29—471.3 **9 Claims**



Apparatus and method for forming a feeder for flowing streams of filament-forming material such as molten glass by deforming tubular members into contoured longitudinal members and subsequently securing the longitudinal members to a plate with orifice openings in alignment with such openings.

3,579,808
TANTALUM CLAD NIOBIUM

Melvin A. Hagan, Palos Verdes Peninsula, and Roy I. Batista, Palos Verdes Estates, Calif., assignors to TRW Inc., Redondo Beach, Calif.

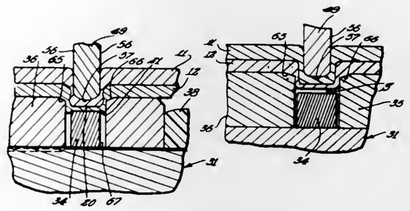
Filed Mar. 20, 1969, Ser. No. 809,039
Int. Cl. B235 *31/02*
U.S. Cl. 29—497.5 **1 Claim**

This invention relates to composite metal article and method for making the same wherein tantalum metal is applied to the surface of niobium metal and the two metals are diffusion bonded in a protective environment. The bonded metals may be cold worked to produce the final fabricated article.

3,579,809
METHOD OF JOINING SHEETS OF RIGID DEFORMABLE MATERIAL

Cecil R. Wolf, Rock Falls, and John P. Holland, Sterling, both of, Ill., assignors to Frantz Manufacturing Company, Sterling, Ill.

Filed Dec. 13, 1968, Ser. No. 792,194
Int. Cl. B21d *39/00;* **B23p** *11/00*
U.S. Cl. 29—509 **13 Claims**



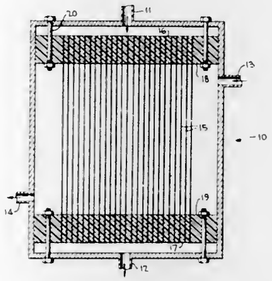
A method of securing together, as by staking, superimposed strips or sheets of rigid yet deformable material, such as mild steel, having generally planar surfaces. The method includes positioning the superimposed sheets between a driven punch and the working face of a stationary anvil upon sheet-supporting members resiliently urged toward each other mounted laterally of said anvil and providing with said punch and anvil a forming space extending directly as well as laterally above, and laterally below, the anvil working face. By a single stroke of said punch, the punch causes a flow of the material of the strips into the forming space to form therein telescoped hollow bosses, or rivets, with a lower wall portion of the inner boss expanded laterally into interlocking engagement with the corresponding laterally confined wall portion of the outer boss and with the material of the lower transverse end of the outer boss yieldably restrained by said resiliently urged members to a predetermined degree of lateral expansion yet free to flow into the portion of the forming space laterally below said anvil working face to provide downwardly extending lateral flanges.

The punch is preferably formed with a pair of opposed lower downwardly converging surfaces and with an intermediate pair of parallel surfaces which together define a generally rectangular striking end, the face of which is arcuate. With this configuration, the striking end of the punch forms hollow bosses that interlock in one plane including the common axis of the bosses, but that are noninterlocking in a plane normal to the first and also including the common axis.

3,579,810
METHOD OF MAKING CAPILLARY ASSEMBLIES FOR OXYGENATORS AND THE LIKE

George Mon, Silver Spring, Md., assignor to the United States of America as represented by the Secretary of the Army

Filed June 13, 1969, Ser. No. 833,056
Int. Cl. B23p *17/00, 25/00*
U.S. Cl. 29—527.1 **8 Claims**

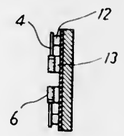


An inexpensive and rapid method of assembling capillary units and the like is disclosed. Commercially available capillary tubing is first wound around two end pins spaced apart a predetermined distance slightly greater than the length of the capillary strands in the completed unit. Each end pin is then dipped into an epoxy potting compound and caused to harden. The hardened ends are thereafter cut in appropriate places so as to expose the capillary tubes. A suitable outer housing, having appropriate conduits for the transfer of blood and oxygen to the unit, may then be provided to the assembled capillaries.

3,579,811
METHOD OF MAKING PASSIVE ELECTRONIC COMPONENTS INCLUDING LAMINATING TERMINALS TO SUBSTATE

Masao Matsuo, Takarazuka-shi, and Hiroshi Tomiwa, Osaka, Japan, assignors to Matsuo Electric Company, Limited, Toyonaka-shi, Osaku-fu, Japan

Filed Dec. 11, 1969, Ser. No. 884,226
Claims priority, application Japan, Dec. 21, 1968, 43/93890
Int. Cl. H01g *13/00*
U.S. Cl. 29—570 **3 Claims**

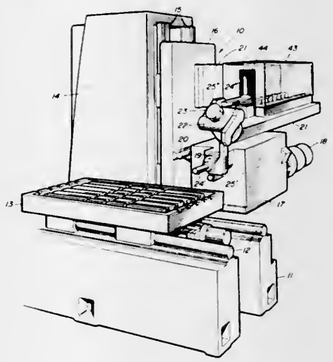


A method of making a chip-shaped electronic component by forming a laminated structure consisting of a metal plate and a substrate adhesively secured to one side thereof. Etching the metal plate to form a plurality of raised terminals and then forming a plurality of elongated conductive members having electronic elements formed on the outer ends thereof, which elements are then electrically and mechanically secured to selected terminals while adjoining portions of said conductive members are secured to other terminals of each set. Enclosing the formed structure within a molded resin and then stripping the substrate to expose one surface of the sets of terminals. Thereafter the structure is cut to separate the components one from the others. An improved electronic component is provided having the terminals on one face thereof which thereby facilitates attachment to a printed circuit board or other electronic circuit structure.

3,579,812
MACHINE TOOL

Stanley A. Pfister, Wilmington, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Sept. 20, 1968, Ser. No. 761,235
Int. Cl. B23q *3/157*
U.S. Cl. 29—568 **4 Claims**

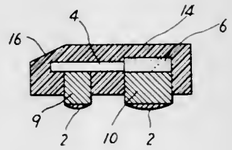


This invention relates to a machine tool and, more particularly, to apparatus for performing a machining operation, which apparatus is provided with a multiple-tool storage rack and means for moving selected tools from that rack into position on a rotatable spindle. The rack is provided with a plurality of identical sockets to carry the tools from the rack to an interchange position and return them to the rack.

3,579,813
METHOD OF MAKING ELECTRONIC COMPONENTS ON COMBLIKE METAL FINGERS AND SEVERING THE FINGERS

Hiroshi Tomiwa, Osaka, Japan, assignor to Matsuo Electric Company, Limited, Toyonaka-shi, Osaka-fu, Japan

Filed Dec. 11, 1969, Ser. No. 884,257
Claims priority, application Japan, Dec. 23, 1968, 43/94395
Int. Cl. H01g *13/00*
U.S. Cl. 29—570 **3 Claims**

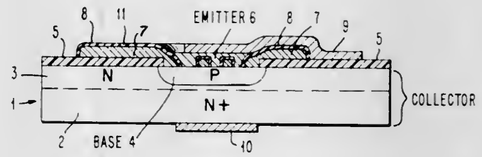


A method of making a chip-shaped electronic component by etching a metal plate to form a plurality of raised terminals, forming a comblike metal plate having electronic elements formed on the outer ends of the projections and then electrically and mechanically securing the electronic elements to the terminals and then separating the individual chip-shaped components to form a resultant structure having downwardly extending terminals which may be readily soldered or otherwise attached to a printed circuit board or other electronic circuit structure.

3,579,814
METHOD FOR FABRICATING A SEMICONDUCTOR DEVICE HAVING AN EPITAXIALLY GROWN REGION

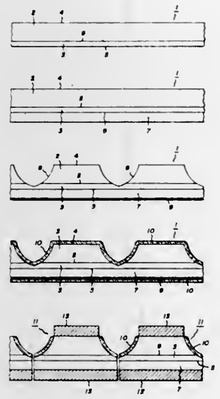
Frederick H. Dill, Jr., Putnam Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 446,780, Mar. 31, 1965, Pat. No. 3,398,335, Filed Mar. 18, 1968, Ser. No. 734,185
Int. Cl. B01j *17/00;* **H01l** *5/00*
U.S. Cl. 29—578 **9 Claims**



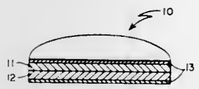
Disclosed is a method of making minute semiconductor devices wherein superposed apertured insulating, metal contact and insulating layers are applied to the semiconductor base layer and semiconductor material is provided within the aperture but spaced from the metal contact layer by the second insulating layer.

3,579,815
PROCESS FOR WAFER FABRICATION OF HIGH BLOCKING VOLTAGE SILICON ELEMENTS
Finis E. Gentry, Skaneateles, N.Y., assignor to General Electric Company
Filed Aug. 20, 1969, Ser. No. 851,596
Int. Cl. B01j *17/00;* **H01l** *5/00*
U.S. Cl. 29—580 **17 Claims**



A silicon wafer provided with at least one voltage-blocking junction is strengthened by epitaxially depositing silicon onto one major surface. The wafer is then etched to form grooved surfaces intersecting the junction. A passivation layer is deposited and fast diffusing impurities are gettered and removed. The wafer is broken into a plurality of discrete, separately useable silicon elements.

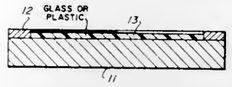
3,579,816
METHOD OF PRODUCING SEMICONDUCTOR DEVICES
Robert C. Ingraham, Topsfield, and Hubert J. Ramsey, Burlington, Mass., assignors to Sylvania Electric Products Inc.
Filed Dec. 23, 1968, Ser. No. 786,208
Int. Cl. H01l *7/00;* **B01j** *17/00*
U.S. Cl. 29—583 **8 Claims**



Method of producing stacked semiconductor rectifiers by placing a plurality of wafers of semiconductor material in a jig alternately with thin wire spacers. The jig is immersed in molten solder, the spacers are removed from between the wafers, and the jig is removed from the solder. The wafers are pressed together while the solder cools, and the solidified assembly is sawed through each wafer to form a plurality of stacks of dice.

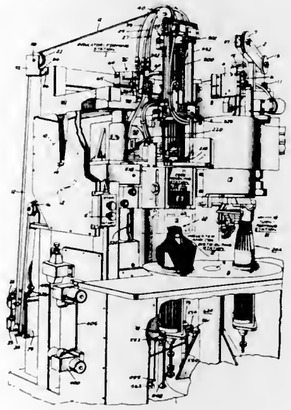
3,579,817
COVER FOR COPLANAR WALLS OF AN OPEN TOP CIRCUIT PACKAGE
Martin A. Boyle, Woodcliff Lake, N.J., assignor to Alpha Metals, Inc., Jersey City, N.J.
Filed May 21, 1969, Ser. No. 826,600
Int. Cl. H01l *1/02*
U.S. Cl. 29—588 **11 Claims**

A cover for hermetically sealing the open end of a circuit package in which a solder border is applied to the marginal areas of the cover, and a dielectric dress is applied within the border; the dielectric dress is sufficiently thick to fit into the



open end of a circuit package and to position the lid in exact registration with the circuit package.

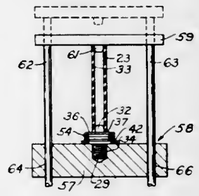
3,579,818
METHOD AND APPARATUS FOR FORMING SHAPED INSULATORS AND FOR DEVELOPING COILS OF A MAGNETIC CORE
Richard B. Arnold, and Dallas F. Smith, Fort Wayne, Ind., assignors to General Electric Company
Filed Mar. 11, 1969, Ser. No. 806,057
Int. Cl. H02k *15/00*
U.S. Cl. 29—596 **20 Claims**



Method and apparatus for developing shaped insulators of different axial lengths and coil turns into coil groups in preselected slots of a magnetic core. The insulators are automatically formed into the desired lengths from a continuous strip of insulative material at an insulator-forming station by apparatus including a feeding mechanism, slotted magazine, cutter, and linkage having a movable pivot operative to effect a change in the length of material advanced into predetermined slots of the magazine. The magazine is mounted to telescope with an outer surface of an insulator and turn-accommodating mechanism or assembly into which the insulators are transferred. Turns are formed into coil groups in the assembly through the outer surface at a turn-forming station, and thereafter the coil groups and insulators are distributed into the preselected slots of the core from the assembly. Where two or more winding phases are to be distributed, the core may be conveniently mounted in a holding device carried by a conveyor which transports the core through a first phase-winding development, where the insulators and one winding are placed in the core, a winding pressback station where the winding is transformed into the desired configuration, and into a second phase-winding development where additional insulators and a winding are added to the core.

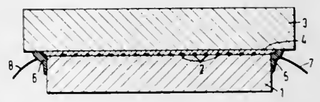
3,579,819
METHOD OF MAKING A RESISTOR
Arthur L. Rozema, Elkhart, Ind.; Lynn J. Brady, Edwardsburg, Mich., and Wayne A. Barden, Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.
Filed Mar. 24, 1969, Ser. No. 809,655
Int. Cl. H01c *17/00*
U.S. Cl. 29—610 **6 Claims**

High-voltage circuit arrangement includes a load connected to a power supply of at least 20,000 volts, and a single discrete high-voltage electrical resistor connected to the power supply and load. The high-voltage resistor comprises a spiral resistive path supported on a ceramic substrate which provides a uniform and continuous heat dissipation path between the ends of the resistor. A heat-dissipating mounting member forms an electrical termination for the resistor, rapidly transfers heat away from the substrate, and includes a substrate alignment surface and seat in close proximity to a surface of the substrate. A threaded portion of the heat-dissipating member is useful for mounting the resistor on a supporting surface and insulative means including an insulative jacket surrounds the substrate. High-voltage corona-inhibiting means include an insulative body that extends one-half



inch beyond an end of the resistive path and embeds a lead wire connected to the resistive path. The resistive path is a cermet-film-type material having a resistivity of 5 megohms per square, a voltage coefficient of less than 400 parts per million per volt per square, and a voltage withstanding ability of 3,000 volts per inch of resistive path. The resistive path itself comprises an intersticed mass of inert particles and a conductive phase forming an interstitial mass within the intersticed mass. The method includes the steps of positioning the mounting member and substrate at a work station, compressively centering the substrate on the mounting member with a movable platen, controlling the transfer of heat relative to the mounting member, and soldering the mounting member to the substrate.

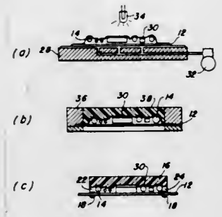
3,579,820
METHOD OF MAKING GALVANOMAGNETIC RESISTOR UTILIZING GRID FOR SHORT-CIRCUITING HALL VOLTAGE
Paul Hini, Erlangen, Germany, assignor to Aktiengesellschaft Siemens, Berlin, Germany
Division of Ser. No. 665,928, Setp. 6, 1967, Pat. No. 3,490,070.
Filed June 24, 1969, Ser. No. 862,547
Int. Cl. H01c *17/00*
U.S. Cl. 29—610 **7 Claims**



A metal grid is placed on the surface of a semiconductor layer for short-circuiting Hall voltage in the semiconductor layer. The semiconductor layer is placed on a carrier plate with the grid interposed between the semiconductor layer and the carrier plate.

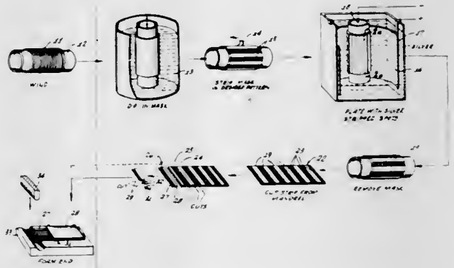
3,579,821
METHOD OF MAKING CONFORMAL BLOCKS FOR EVAPORATIVELY COOLING CIRCUIT ASSEMBLIES
Albert G. Kurisu, Anaheim, Calif.
Assignor to the United States of America as represented by the Secretary of Navy.
Filed Aug. 21, 1969, Ser. No. 851,866
Int. Cl. H05k *3/28*
U.S. Cl. 29—627 **2 Claims**

A conformal block for evaporatively cooled modular electronic packages is disclosed. The conformal block provides a predetermined convective path for a coolant and controls the mixture ratio of the two-phase (liquid and vapor) flow to provide an optimized vapor/liquid mixture at the outlet port. This result is achieved by confining the components within a vertical flow duct and sizing the liquid inlet passage at the bottom of the block as a function of the heat load. The outlet



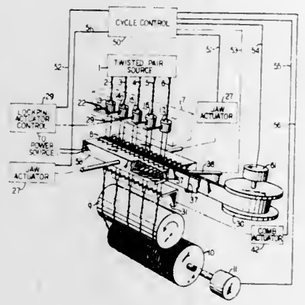
port is located above the normal liquid level to prevent further liquid entrainment. The fixed location of the outlet provides a relatively consistent flow path to the condenser under adverse inclination angles in respect to gravity direction.

3,579,822
METHOD AND BLANK FOR MAKING POTENTIOMETER CONTACT SPRINGS
Frank L. Dieterich, 3727 S. Robertson Blvd., Culver City, Calif.
Filed May 13, 1968, Ser. No. 728,683
Int. Cl. H01r *9/00*
U.S. Cl. 29—630 **4 Claims**



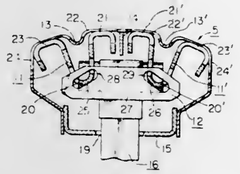
A method of manufacturing miniature potentiometer contact springs by winding a substantial length coil of a single layer of fine, heat-treatable precious metal alloy wire on a generally cylindrical form, masking spaced strips longitudinally of the wire coil, silver plating the wire coil between the masked strips, removing the strips and cutting the strip-plated wire band from the mandrel as a sheet, cutting the wire sheet in the middle of the plated and unplated strips to produce control strip blanks having short free wires at one end and joined plated wires at the other end. The free ends of the wires in the blank are then formed into radiused points of contact, and the blank heat-treated to develop hardness, wear resistance and spring characteristics in the wire fingers. This blank may itself form an article of commerce with the customer (or the original manufacturer) slicing the strip blank into the desired contact widths, forming the plating bonded portion, if desired, and attaching it to a support. The wire may be wound on a solid mandrel and the coil plated only on its outer surface or on a slotted mandrel and the coil plated on both inside and outside surfaces at the slots.

3,579,823
APPARATUS AND METHOD FOR APPLYING INDEXING STRIPS TO CABLE PAIR GROUPS
Tillman J. Gressitt, Lutherville, Md., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Sept. 12, 1969, Ser. No. 857,503
Int. Cl. H01r *6/00*
U.S. Cl. 29—630 **10 Claims**



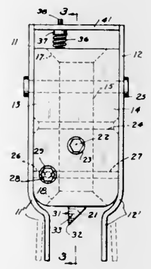
This application describes apparatus for placing thin complaint strips at intervals crosswise over a group of advancing twisted wire pairs. The two wires of each pair thread through separate threadways in a lockable rotor. As the twisted pairs advance in unison, the respective rotors turn at rates differing with the various pair twist lengths. The rotors are locked at different times, but each in a position that conforms all threadways in a single plane. The strips are then applied downstream of the rotors, where by then the wires lie flat. Thereafter, the rotors are unlocked.

3,579,824
ELECTRIC DRY SHAVER
Masamiki Matsumoto; Motohisa Nishino, and Yoshimasa Tanaka, Kadoma-shi, Osaka, Japan, assignors to Matsushita Denko Kabushiki Kaisha, Osaka, Japan
Filed May 26, 1969, Ser. No. 827,847
Claims priority, application Japan, May 31, 1968, Nov. 30, 1968, Dec. 6, 1968, Dec. 13, 1968, Feb. 26, 1969, 43/45,514; 43/104,450; 43/106,847; 43/109,426; 44/14,496
Int. Cl. B26b *19/02*
U.S. Cl. 30—43.92 **12 Claims**



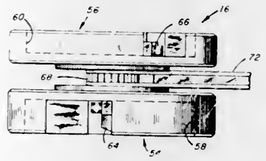
An electric dry shaver having a shaving blade part, which comprises an outer cutter blade provided with side cutting surfaces respectively continuous to its upper cutting surface, at least a pair of inner cutter blades reciprocally driven inside and relative to the outer cutter blade in its longitudinal direction and provided respectively with a side blade part to oppose to one of the side cutting surfaces of outer cutter blade and with an upper blade part to be opposed to a part of the upper cutting surface of outer cutter blade adjacent said side cutting surface, and a biasing means to urge the inner cutter blades to resiliently engage inner surfaces of the outer cutter blade. Said biasing means is provided with a means to distribute its biasing force uniformly to each of the inner cutter blades and, specifically to those inner blades having the side blade part, in a diagonal direction with respect to axial line of the biasing means toward respective corner edges between the upper cutting surface and side cutting surfaces of outer cutter blade, so that such inner cutter blades are always pressed against the upper and side surfaces of outer blade simultaneously.

3,579,825
ELECTRICIAN'S TOOL FOR LONGITUDINALLY AND CIRCUMFERENTIALLY CUTTING INSULATION ON WIRE
Alfred H. Powell, 19321 108th Ave. N.E., Bothell, Wash.
Filed Nov. 27, 1968, Ser. No. 779,557
Int. Cl. B26b *27/00*
U.S. Cl. 30—90.7 **3 Claims**



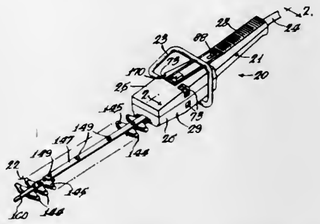
This tool has a blade carrying assembly supporting a blade so it can be adjusted for depth of cut and can be set in one position to slit insulation lengthwise on a wire and in another position to cut the insulation around the wire. The blade has graduation marks on it so the depth of cut it is set to make can be read directly. Two wire-guiding members at opposite sides of the blade and the blade-carrying assembly are adjustable toward and away from each other to receive and hold wires of different sizes.

3,579,826
TOOL FOR SIMULTANEOUSLY BEVELING MATING PIPES
Eldon W. Morain, Tulsa, Okla., assignor to Continental Industries, Inc., Tulsa, Okla.
Filed July 9, 1969, Ser. No. 840,201
Int. Cl. B23d *21/06*
U.S. Cl. 30—93 **1 Claim**



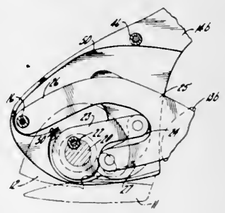
This invention relates to a method for permanently joining the ends of two lengths of plastic pipe and includes a beveling tool and heating tool for use in preparing the pipes for the joining.

3,579,827
HEDGE TRIMMER
Robert D. Grahn, Hinsdale, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Aug. 1, 1966, Ser. No. 569,490
Int. Cl. B25f *3/00*
U.S. Cl. 30—144 **4 Claims**



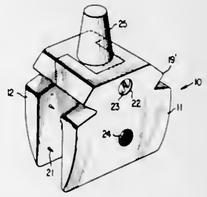
An electric hedge trimmer having an elongated split housing with the front portion enlarged to house the motor and the rear portion providing a handle. The motor drives a toothed cutter blade with a saw blade attached to the end. A transversely disposed loop-shaped handle is provided and a level guage is secured on top of the housing.

3,579,828
HEAVY-DUTY METAL SNIPS
Andrew M. Hexdall, c/o A. M. Hexdall Company, Morris, Ill.
Filed June 30, 1969, Ser. No. 837,623
Int. Cl. B26b *13/00*
U.S. Cl. 30—251 **15 Claims**



A pair of heavy-duty metal snips is disclosed in which the operative blade is moved by an eccentric pin coupled to the operative handle by a crank arm and link. The other blade is rigid with a flat mounting plate and the link is designed to nest within cooperative portions of the handle. The crank arm, link and eccentric are arranged so that the mechanical advantage transferred to the operative blade increases as it moves toward the closed position.

3,579,829
PERICORTICAL DENTAL IMPLANT AND INSERTER THEREFOR
Arnold Sampson, Pittsburgh, Pa., assignor to The Sampson Corporation, Pittsburgh, Pa.
Filed Jan. 22, 1970, Ser. No. 4,904
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 **13 Claims**

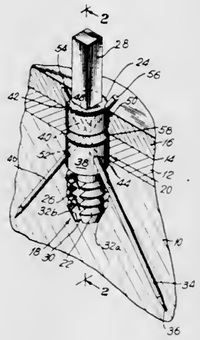


A pericortical implant for the retention of various dental prosthetic replacements in the form of a two-part clamp adapted to be placed about either the mandible or maxilla of the patient and having a mounting post for reception of the dental prosthesis. An inserter device including a force-applying screw for moving one clamp half with respect to the other and having extendible arms for temporarily retaining the clamp halves in position is provided for rapid application of the clamp.

3,579,830
BONE IMPLANT
Joseph Morel, 14 Villers Bocage, France
Filed Oct. 1, 1969, Ser. No. 862,728
Claims priority, application France, Oct. 1, 1968, Sept. 19, 1969, 168337; 69-31944
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 **7 Claims**

A bone prothesis implant as disclosed is formed by a metal rod which terminates in a screw in the form of a gimlet of conical pitch with rounded edges. This screw, intended to be introduced into the bone, is characterized in that each of its threads, except that of the point, appears in elevation as a truncated cone, of which the bases are inclined relatively to the axis of the screw. The end of the screw preferably ends in a point, so as to be able easily to penetrate into the bone.

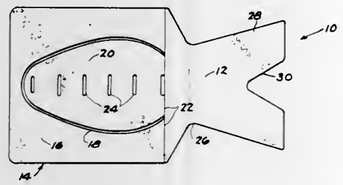
3,579,831
BONE IMPLANT
Irving J. Stevens, 130 Margaret Blvd., Merrick, N.Y., and Jerry Alexander, 64 Hedgerow Lane, Jericho, N.Y.
Filed Mar. 5, 1969, Ser. No. 804,625
Int. Cl. A61c *13/00*
U.S. Cl. 32—10 **9 Claims**



A bone implant such as a dental implant to be received in a jaw bone. The bone implant includes a screw which has a pair of opposed end regions, one of which is threaded for the purpose of screwing into bone and the other of which is provided with a means for fastening any other desired structure to the screw. For example, in the case of a dental implant this fastening means can be used to fasten a crown to the screw. In addition to the screw the bone implant of the invention includes at least one stabilizing pin operatively connected with

the screw to stabilize the latter in the bone, so that as a result of the stabilizing, the screw will be reliably retained in the bone.

3,579,832
ANATOMY RELATING DEVICE FOR DENTISTS
Hugh Cooper, Jr., 425 E. Washington St., Ann Arbor, Mich.
Filed Oct. 2, 1969, Ser. No. 863,288
Int. Cl. A61c *9/00*
U.S. Cl. 32—17 **10 Claims**

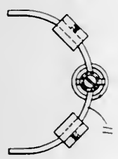


A flat sheet of expanded polystyrene is creased to provide a hinge between an insert to be placed between a patient's maxillary and mandibular teeth and a two-part flap, the outer part being swung upwardly before the patient's face so that his interpupillary line and midsagital plane can be marked thereon. With the sheet flattened, the midsagital plane location is also marked on the inner flap. The insert takes a permanent impression of the patient's cusps when the patient bites thereon. When the insert is transferred to a laboratory model, the flaps are turned upwardly to facilitate transferring the information marked thereon directly to the model.

3,579,833
ODONTOLOGICAL INSTRUMENT
Americo Colombo, and Ugo Ronchetti, via dei Partigiani 12, Como, Italy
Filed Jan. 2, 1969, Ser. No. 788,389
Claims priority, application Italy, Jan. 19, 1968, 3802-A/68
Int. Cl. A61c *1/10*
U.S. Cl. 32—27 **1 Claim**

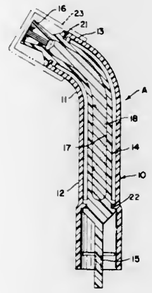
An odontological instrument for introduction into and hollowing out the root channels of the teeth, comprising an angled-off longitudinal handle terminating in a head accommodating a worm and worm wheel, fixed and movable cam means, a spring acting upon the movable cam, and a tool carrying shaft which imparts to the tool a screwing movement and a rapid axial retracting movement.

3,579,834
CROWN AND BRIDGE REMOVER
Charles C. Reed, Jr., 4225 Mayfield Road, Cleveland, Ohio
Filed Aug. 21, 1969, Ser. No. 851,801
Int. Cl. A61c *3/16*
U.S. Cl. 32—43 **10 Claims**



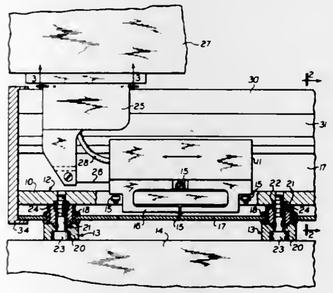
A crown and bridge remover comprises an arch bar, a pair of stabilizers and two pronged crown lifters. The lifter prongs are adapted to fit under the crown. The arch bar is substantially the shape of an average row of teeth and is bendable to fit the mouth of an individual patient. The stabilizers are mounted on the arch bar so that they may be on either side of the crown or bridge to be pulled. The lifter is mounted on the arch bar between the stabilizers and provided with threaded means to draw the prongs toward the arch bar and thus remove the crown.

3,579,835
DENTAL PASTE DISPENSING TOOL
Myron F. Levenson, 5596 Mayfield Road, Lyndhurst, Ohio
Filed Jan. 6, 1969, Ser. No. 789,252
Int. Cl. A61c *3/06*
U.S. Cl. 32—58 **10 Claims**



A rotary dental tool is provided with self-contained means for automatically feeding a dentifrice to an applicator. The dentifrice is contained in an elongated tubular element that serves as a flexible coupling extending between a rotary drive and the tool head. During operation, the drive causes twisting of the tubular element, thereby urging the dentifrice toward the applicator.

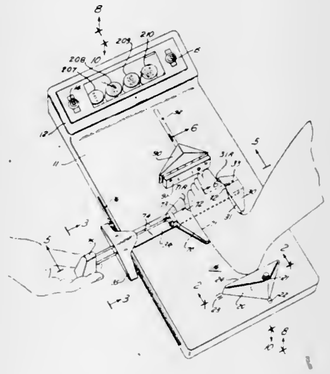
3,579,836
ARRANGEMENT FOR MEASURING OF LENGTHS
Heinz Kraus, and Siegbert Holstein, Traunreut, Germany, assignors to Dr. Johannes Heidenhain, Traunstein, Germany
Filed May 8, 1969, Ser. No. 822,935
Claims priority, application Germany, May 10, 1968
P 17 73 403.1
Int. Cl. G01b *11/02;* **B23q** *17/02*
U.S. Cl. 33—1R **22 Claims**



An arrangement for measuring of lengths, which comprises a measuring system including a measuring rod and a sensing device. The measuring system is enclosed for protection against disturbing outer influences. A covering shaft has a U-

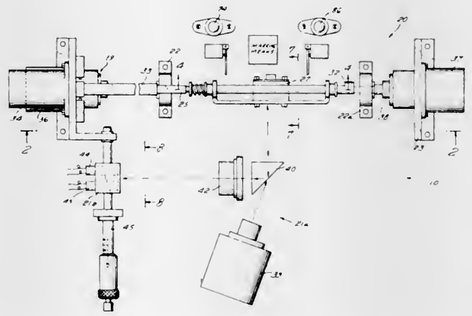
profile and receives the sensing device. Resilient sealing lips of bendable material engage the leg portions of the covering shaft over its entire length and covers as a roof member the covering shaft. A driver projects through the sealing lips and has a cross section of a sword favoring the adherence of the sealing lips.

3,579,837
FOOT MEASURING APPARATUS
Charles A. Soriano, Fairfield, Conn., assignor to Atwater-Forbes Corporation, Westport, Conn.
Filed June 12, 1969, Ser. No. 832,570
Int. Cl. A43d *1/00*
U.S. Cl. 33—3 **7 Claims**



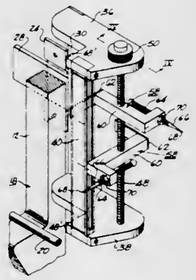
A portable, battery-operated human foot-measuring apparatus is provided for simultaneously measuring the arch length and related width length of the foot as well as the heel-toe length. The apparatus operates in such a manner that one can measure either right or left foot within a single four sided measuring zone without mechanical rotation or change of scales and electronic readout means are provided for indicating all measurements.

3,579,838
METHOD OF THERMOMETER POINTING AND APPARATUS THEREFOR
Waldemar A. Ayres, Rutherford, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.
Continuation-in-part of application Ser. No. 612,692, Jan. 30, 1967, now abandoned. This application Apr. 5, 1968, Ser. No. 719,214
Int. Cl. B43l *13/24*
U.S. Cl. 33—19 **10 Claims**



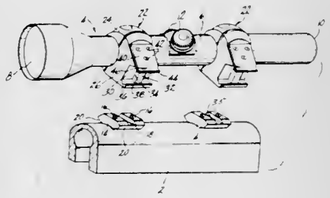
A thermometer-pointing apparatus which automatically performs the required facing operation and horizontal scanning to sense and accurately locate the top of a mercury column for purposes of pointing. For such purposes a photoelectric control system is connected with electromechanical means for manipulating the thermometer automatically as the top of the mercury column is being located and an improved optical system is provided for projecting a magnified image of the mercury column onto the photoelectric control system which is responsive thereto, thereby facilitating the pointing of the thermometer.

3,579,839
ARCHERY BOW SIGHT
Robert J. Kowalski, 512 Berner St., Pittsburgh, Pa.
Filed Nov. 5, 1968, Ser. No. 773,525
Int. Cl. F41g *1/00;* **F41b** *5/00*
U.S. Cl. 33—46 **4 Claims**



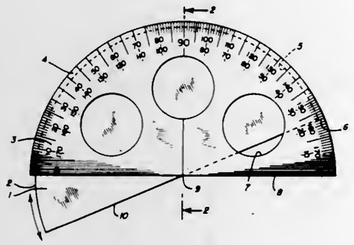
Described is an archery bow sight in which a sighting element is held in position on a bracket at a location for an approximate range, and incorporating vernier adjustment means on the bracket whereby fine adjustments in range can be made after the sighting element is positioned at its approximate range position on the bracket.

3,579,840
SNAP OFF TELESCOPE MOUNT
Joseph A. Heinzel, El Paso, Tex., assignor to Olin Corporation
Filed Sept. 4, 1969, Ser. No. 855,131
Int. Cl. F41g *1/38, 1/42*
U.S. Cl. 33—50 **11 Claims**



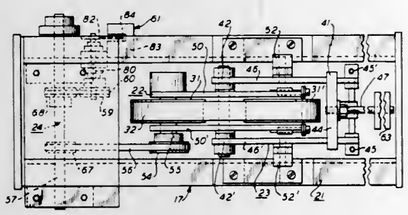
A mount for securing a telescope sight to a firearm, which mount is snapped on and off of the firearm without the need of special tools. The mount includes a base portion which is secured to the firearm, and a ring portion which is secured to the scope. A tongue and groove connection positions the ring portion longitudinally with respect to the base portion and prevents longitudinal movement from occuring between the scope and the firearm such as would be initiated by recoil when the firearm is fired. A spring clamp is arranged to position the ring portion laterally with respect to the base portion to resist lateral movement of the scope.

3,579,841
PROTRACTOR
Dana Peterson, P.O. Box 412, Coronado, Calif.
Continuation of application Ser. No. 752,695, Aug. 14, 1968, now abandoned. This application Feb. 2, 1970, Ser. No. 4,435
Int. Cl. B43l *13/00*
U.S. Cl. 33—75 **2 Claims**



A compact protractor having an outer transparent semicircularly shaped outer casing part and an opaque similarly shaped inner member snugly received therein for rotation. Openings and indicia are provided on the transparent outer casing.

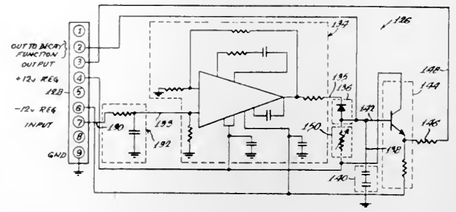
3,579,842
CABLE-MEASURING MACHINE
Joseph William Scher, Short Hills, N.J., assignor to Weber & Scher Mfg. Co., Inc., Newark, N.J.
Filed Sept. 27, 1968, Ser. No. 763,324
Int. Cl. G01b *3/12*
U.S. Cl. 33—133 **11 Claims**



In a machine for the measurement of length of cable passing a given point, a rotating constant-pressure belt measuring unit which comprises structural features, including a rotatable measuring unit, maintaining a constant and continuing contact with the cable to accurately measure same without interfering with the movement of the cable through the machine.

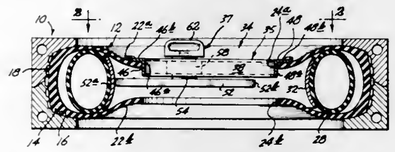
3,579,843
GAGE WITH VARIABLE RESPONSE AMPLIFIER
Edward Peonski, West Dundee, Ill., assignor to American Gage & Machinery Company, Elgin, Ill.
Filed Apr. 8, 1969, Ser. No. 814,405
Int. Cl. G01b *5/00;* **G01r** *15/08*
U.S. Cl. 33—147 **8 Claims**

An improved gage in combination with an amplifier which will respond more rapidly to a change of signal in one direction than to a change of signal in the opposite direction



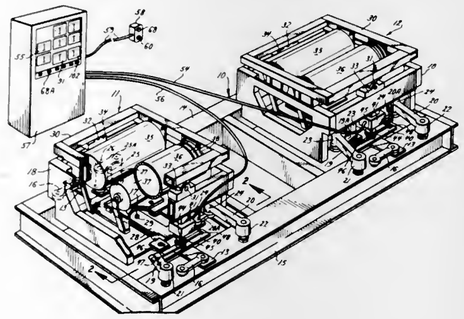
and where the ratio of the response rate in one direction to the response rate in the other direction is adjustable.

3,579,844
BACKING RING CENTERING DEVICE
Arne K. Olofson, 15396 S.E. River Forest Road, Milwaukee, Oreg.
Filed Sept. 23, 1968, Ser. No. 761,432
Int. Cl. G01b *3/38*
U.S. Cl. 33—180 **7 Claims**



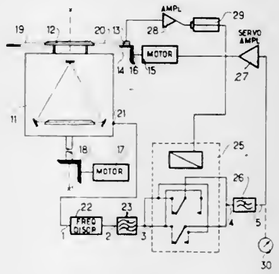
A device for centering an annular backing ring within a tire casing, the device including an elongated guide supported against diametrically opposed regions of a bead on the casing and an indicator bar mounted for movement relative to the guide. The indicator bar may be moved into contact with diametrically opposite internal regions of the backing ring and cooperating graduations and marker on the guide and bar indicate the position of the bar, and thus the position of the backing ring, relative to the guide member.

3,579,845
DYNAMIC WHEEL TOE AND TIRE PULL TESTING APPARATUS
Lee Hunter, St. Louis County; David A. Senften, Florissant, Mo., and Edwin W. Logan, Belleville, Ill., assignors to Hunter Engineering Company, Bridge, Mo.
Filed Mar. 27, 1969, Ser. No. 811,160
Int. Cl. G01b *19/28*
U.S. Cl. 33—203.13 **7 Claims**



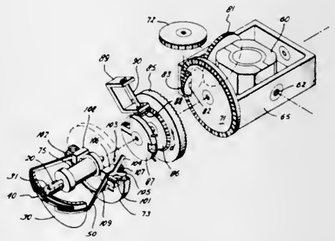
Dynamic testing apparatus for vehicle wheels for determining the wheel toe relationship and for measuring the extent of lateral pull or scuffing developed between the tire tread and the road surface. The apparatus includes adder-memory and subtractor-memory circuits responsive to wheel toe signals generated by a dynamic wheel driving apparatus which rotates the wheels in forward and reverse directions to obtain wheel toe measurements independent of the lateral pull developed by the tire characteristics on the rotating surfaces and to obtain an indication of the tire pull characteristics of the tire.

3,579,846
LASER GYROMETER SYSTEM
Jean-Michel Catherin, Savigny-Sur-Orge, France, assignor to Compagnie General D'Electricite, Paris, France
Filed Dec. 15, 1967, Ser. No. 690,814
Claims priority, application France, Dec. 15, 1966, June 5, 1967, 87563;109148
Int. Cl. G01c *21/00*
U.S. Cl. 33—204 **18 Claims**



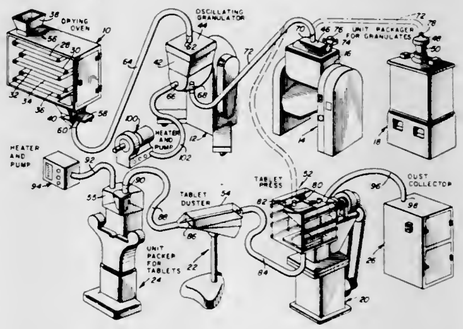
Variation of output frequency of a laser gyrometer, the plane of which rotates about a vertical axis, is utilized to ascertain the direction of geographical North. Adequate mechanical construction reduces several inaccuracies to a minimum.

3,579,847
ATTITUDE INDICATOR
John W. Winter, and Guy K. Harrison, Jr., Houston, Tex., assignors to Aviation Instrument Manufacturing Corporation
Filed May 29, 1968, Ser. No. 732,987
Int. Cl. G01c *19/44;* **G01d** *7/02, 5/02*
U.S. Cl. 33—204 **12 Claims**



An instrument for indicating roll and pitch attitude of a host craft. The instrument comprises a support for attaching the instrument to the host craft and a terrain reference including a horizon line fixed relative to the host craft parallel to the transverse axis of the craft. A gyroscope is universally mounted in the support to maintain a stabilized datum reference perpendicular to the earth. The gyroscope is coupled through gears and linkages to a simulator which represents the host craft as viewed from the rear. The simulator is mounted adjacent the terrain reference for angular movement with respect to the horizon line to indicate roll and for radial movement relative to the horizon line center to indicate pitch. In one embodiment the simulator is a three dimensional representation of the host craft pivotably connected to the coupling mechanism for pitch movement relative to the horizon line in the same sense the host craft pitches relative to the natural horizon. As the host craft rolls or pitches relative to the stabilized datum gyroscope the rotation and movement of the gear and linkage coupling devices effect the various responsive displacements of the simulator for attitude indication.

3,579,848
METHOD OF CONTROLLING HUMIDITY CONTAMINATION OF HYGROSCOPIC MATERIAL-HANDLING MACHINES
Tomas Hernandez, 9220 S.W. 38th St., Miami, Fla., and Valentin E. Lorenzo, 119 N.E. 20th St., Miami, Fla.
Division of Ser. No. 720,259, Apr. 10, 1968, Pat. No. 3,500,554. Filed Jan. 19, 1970, Ser. No. 3,781
Int. Cl. F26b *5/04*
U.S. Cl. 34—15 **5 Claims**

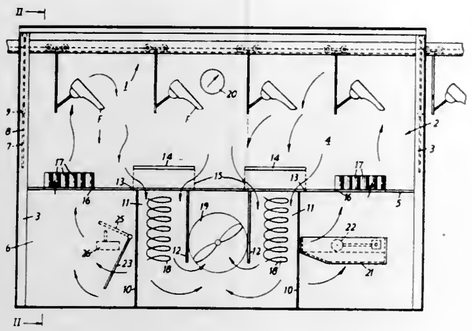


The method of reducing and substantially eliminating water contamination of hygroscopic materials of the type being processed by a series of enclosed material-processing machines and conveyed from each material-processing machine to the next machine through closed material conveyance passages extending between and continuously communicated with the enclosed material-processing machines. The method comprises the step of pumping heated air of low relative humidity under pressure into the enclosed area of the last material-processing machine to which the material is conveyed and allowing the heated air to flow upstream, relative to the direction of material flow, through the material-processing machines and closed conveyance passages to the material-processing machine into which the material to be processed is first discharged.

3,579,849
HEAT SETTING OF FOOTWEAR
Alfred Freeman, 94 Orlingburg Road, Isham, Northamptonshire, England
Filed Sept. 16, 1968, Ser. No. 762,234
Claims priority, application Great Britain, Sept. 21, 1967, 42909/67
Int. Cl. F26b *19/00*
U.S. Cl. 34—48 **6 Claims**

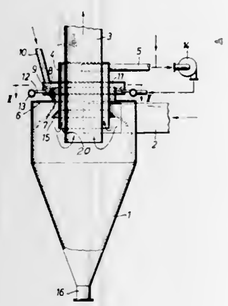
Heat-setting footwear by advancing same through closed chamber in which hot, moisture-saturated air is circulated. Moisture saturation maintained by hot air passing over shallow evaporation tank continuously supplied with water via a ball valve. Air-heating coils in chamber controlled by tem-

perature-responsive device adjacent footwear being treated so as to maintain temperature constant. Also discloses plu-



rality of spaced unit-construction heat-setting chambers in conjunction with chain conveyor.

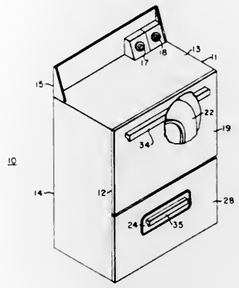
3,579,850
DEVICE FOR FEEDING PULVERULENT MATERIAL
Herbert Deussner, Bensberg-Refrath, and Jurgen Langmaack, Niederkassel, Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne-Deutz, Germany
Filed Mar. 3, 1969, Ser. No. 803,801
Claims priority, application Germany, Mar. 15, 1968, P 16 67 148.0
Int. Cl. F26b *17/10*
U.S. Cl. 34—57E **1 Claim**



A device for feeding pulverulent material into a cyclone for treatment therein by a gas. The pulverulent material is introduced into a ring-shaped chamber near the bottom of which a gas is tangentially injected by a number of nozzles which is mixed with the pulverulent material to form a uniform mist which through an annular overflow aperture at the top wall of the ring-shaped chamber overflows into an annular connecting slot which latter discharges the mixture of pulverulent material and gas downwardly into the upper portion of the treatment chamber in the cyclone.

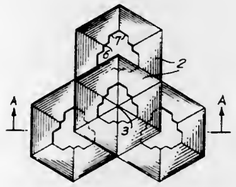
3,579,851
POP-OUT LINT TRAP AND DOOR INTERLOCK FOR LAUNDRY APPARATUS
Richard A. Elmy, Mansfield, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed May 19, 1969, Ser. No. 825,644
Int. Cl. F26b *21/06*
U.S. Cl. 34—82 **9 Claims**

A combination interlock and maintenance reminder for clothes dryer apparatus which prevents unintentional restarting of the dryer after interruption thereof, prior to the end of the cycle, and which reminds the operator to keep the lint trap clean. The invention is characterized by a lint filter located at the front of the dryer and operatively associated with the access door thereof such that when the latter is open



the lint trap moves partially beyond the front wall of the dryer to thereby remind the user that it should be cleaned. Both the lint filter and the front door cooperate with circuit interrupt means such that both must be closed in order for the apparatus to operate.

3,579,852
VERTICAL GRAIN-DRYING DEVICE
Nikola Beograd Ivackovic, and Milija Urosevic, Cacak, Yugoslavia, assignors to Cer Preduzece Termo-Tehnickih Uredajaja I Montaza, Cacak, Yugoslavia
Filed Oct. 17, 1969, Ser. No. 867,236
Int. Cl. F26b *17/12*
U.S. Cl. 34—167 **9 Claims**

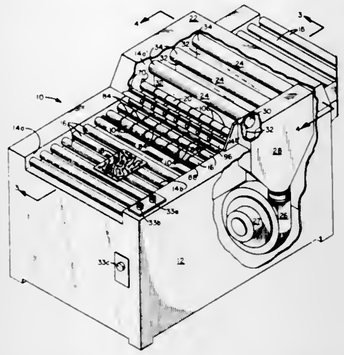


A grain-drying device is constituted by a plurality of horizontal layers which are vertically juxtaposed and respectively formed of inverted truncated pyramid sections adjacent one another and with common upper bounding edges to define a honeycomb arrangement, the sections of each layer being horizontally offset from the sections of the next lower layer such that apertures in the lower ends of the sections of the upper layer are disposed at the junctions of the sections of the lower layer whereby downwardly flowing material in each section will divide and pass into the adjoining sections in the lower layer. The downwardly flowing material is dried by passing a drying medium through broken channels formed between adjacent sections in each layer.

3,579,853
CIRCUIT BOARD DRIER
Joseph J. Martino, 7013 El Prauo Circle, Buena Park, Calif.
Filed Dec. 5, 1968, Ser. No. 781,566
Int. Cl. F26b *19/00*
U.S. Cl. 34—218 **11 Claims**

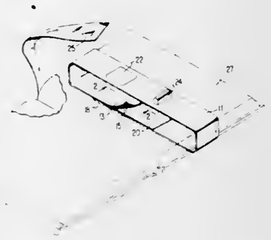
In an apparatus for drying circuit boards, two sets of rollers convey a circuit board past a set of air knives of novel configuration. Each air knife comprises a pair of planar blade members converging to form adjacent their apex an elongate orifice having a width on the order of 0.085 inches. A deflector lip projects from one edge of the orifice. Air forced through the orifice forms an air knife edge having an anemometer static pressure of greater than 10 inches of

water, providing exceptionally quiet, highly effective drying of the board. In some embodiments, a plurality of upper and



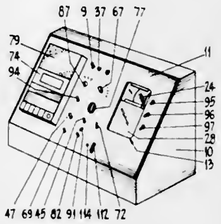
lower horizontally disposed guidewires facilitate drying of thin, flexible boards.

3,579,854
ISOLATION OF INFORMATION
John R. Tusson, R.I. Box 683, Belle Chasse, La.
Filed May 20, 1968, Ser. No. 730,334
Int. Cl. G09b *3/00*
U.S. Cl. 35—8 **17 Claims**



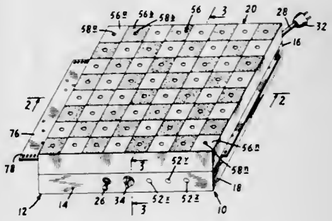
Graphic information contained in coordinated arrays is released a bit at a time by the use of an information isolating device. When an instruction mark on the device is located next to a bit of information in one array, a retrieval mark will be located next to a coordinated bit of information in another array. An endless belt or a metal clip at least in part transparent is placed about a leaf or collection of leaves containing graphic information and is moved to isolate the information.

3,579,855
TEACHING MACHINES
Maurice Reginald Worthy, and Clive Reginald Worthy, 398 Moreland Park, West Brunswick, Victoria, Australia
Filed May 17, 1968, Ser. No. 730,153
Claims priority, application Australia, May 17, 1967, 21891/67
Int. Cl. G09b *5/06*
U.S. Cl. 35—8 **8 Claims**



A teaching machine having means to display a plurality of items of visual information and to reproduce audio information. The visual information carrier is intermittently advanced to present new items. Means are provided to cause reproduction of the sound information during a portion of the dwell period of each visual item and to render the reproduction means ineffective while the visual information carrier is advancing to a new item.

3,579,856
AUTO-CHESS APPARATUS AND PUNCHED CARD THEREFOR
Frederick L. Way, 8 Hillcrest Lane, Woodbury, N.Y.
Filed July 22, 1968, Ser. No. 746,449
Int. Cl. G09b *19/22;* **A63f** *3/02*
U.S. Cl. 35—8 **8 Claims**



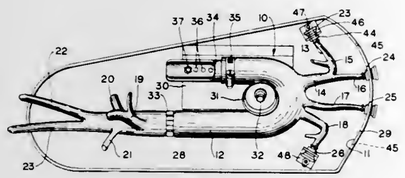
As described herein, a light source mounted in a housing illuminates each column of a prepunched chess card as the card is intermittently driven through the housing. Each column of the card, except for a start of new game column, includes at least two apertures which transmit the light to the light receiving ends of two of a possible 64 light fibers. The light transmitting ends of the fibers extend to the squares of a chess pattern formed in the top plate of the housing and illuminate the squares when their corresponding light receiving ends are illuminated by the light source. The illuminated squares indicate the chess piece to be moved and the square to which the piece is to be moved.

3,579,857
ELECTRIC TEACHING DEVICE
Jack L. Lamberson, Miami, Fla. (1200 Missouri St., Apt. 609, Baytown, Texas, 77520)
Filed Oct. 3, 1969, Ser. No. 863,430
Int. Cl. G09b *7/00*
U.S. Cl. 35—9 **7 Claims**

An electric device in which a selected teaching sheet is inserted and registered thereon. The sheet has printed thereon a number of different characters. A network of circuit closing conductors are positioned in the device under the sheet

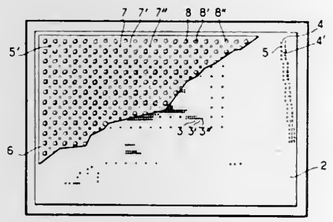
and covered by a resilient member having openings therein corresponding in position to each character. Each sheet has a conducting area on the opposite side of certain selected characters. The student is asked to press a finger directly on one of the selected characters. When correctly pressed, the circuit connected to the network will energize a lamp and buzzer.

3,579,858
ANATOMICAL MODEL
Itzhak E. Bentov, Belmont, Mass., assignor to Medi-Tech Incorporated, Belmont, Mass.
Filed Aug. 28, 1969, Ser. No. 853,849
Int. Cl. G09b *23/32*
U.S. Cl. 35—17 **10 Claims**



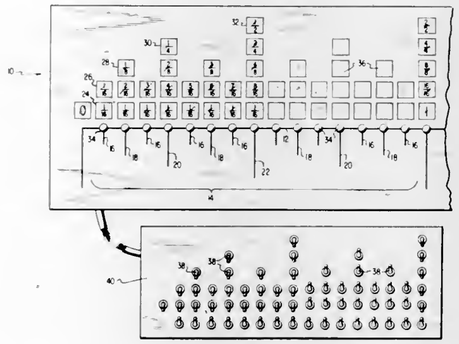
An anatomical model comprises a simulated main body blood vessel having a predetermined curvature at a portion thereof and is formed of a yieldable plastic material. At least one simulated secondary blood vessel is interconnected with the main body blood vessel at the curved portion. Means mount the model and comprise means for varying the positioning of the secondary blood vessel with respect to the main body blood vessel to correspond with variations caused by aging or abnormalities in naturally occurring blood vessels. Preferably the anatomical model simulates the aorta and attached arteries.

3,579,859
DESIGN GRID WITH VARIABLE GUIDE
Pierre Malenge, 19Rie Nationale, Raches, (Nord), France
Filed Jan. 29, 1969, Ser. No. 795,092
Claims priority, application France, Feb. 2, 1968, 138,577
Int. Cl. G09b *1/04*
U.S. Cl. 35—27 **10 Claims**



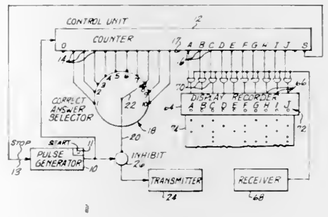
A game for making drawings or FIGS. and constituted by a plurality of ornamental elements adapted to be suitably positioned on a support, said game comprising at least one colored sheet or plate covered with a plurality of suitably located spots on the surface thereof, said sheet being associated to a grid provided with openings superimposed to said sheet and adapted to unveil through the openings thereof some of the spots of said colored sheet, which altogether form a design or drawing.

3,579,860
VISUAL AID FOR TEACHING AND TESTING THE SIGHT READING OF THE FRACTIONAL DIVISIONS OF AN INCH
Lawrence F. Strem, 810 Valley View Drive, La Vale, Md.
Filed Apr. 10, 1969, Ser. No. 814,998
Int. Cl. G09b *19/00*
U.S. Cl. 35—31 **3 Claims**



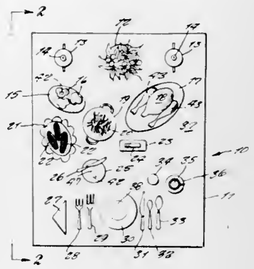
A visual aid for teaching and testing sight reading of the fractional divisions of a unit of measure which includes a plurality of selectively energizable indicators associated with an enlarged scale reproduction of the unit of measure.

3,579,861
SINGLE-CHANNEL ELECTRONIC QUESTION-RESPONSE SYSTEM
Thomas E. Hallett, Bainbridge Island, Wash., assignor to BRD Inc., Bainbridge Island, Wash.
Filed Feb. 6, 1969, Ser. No. 797,181
Int. Cl. G09b *5/00*
U.S. Cl. 35—48R **12 Claims**



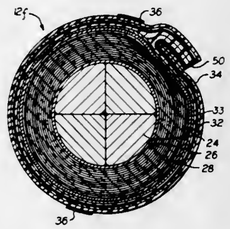
The teaching response system disclosed entails a control unit used by an instructor and a plurality of response unit used by individual students. The correct answer to a question is selected on a multiposition switch in the control unit and the students select their answers on similar multiposition switches in the response units. A timed correct answer signal is transmitted to the response units, wherein the students' answers are individually compared with the indicated correct answer and individual correctness signals are derived and transmitted over a single communication channel in sequence from the respective response units back to the control unit, in which they are recorded and displayed. The system relies upon time coincidence for determining correctness of the answers selected on the response units and sequencing means for monitoring the individual correctness signals.

3,579,862
SET A TABLE PUZZLE
Sue Ballen, 651 Desert Lane, Las Vegas, Nev.
Filed May 15, 1969, Ser. No. 824,921
Int. Cl. G09b *1/10;* **A63f** *9/08*
U.S. Cl. 35—8 **1 Claim**



An educational toy particularly for girls and for teaching them the proper place setting of a table, the device comprising a base panel having various design-shaped indentations for receiving corresponding configurated protrusions on the undersides of various dishes and other table placement items, thus serving as a puzzle for proper alignment of corresponding design indentation and protrusions while at the same time serving an educational purpose.

3,579,863
VIP JACKET UNDER SKID WIRE OF PAPER POWER CABLES
Martin H. McGrath, 200 E. 15th St., New York, N.Y.
Filed June 19, 1969, Ser. No. 834,795
Int. Cl. H02g *15/20*
U.S. Cl. 174—10 **7 Claims**

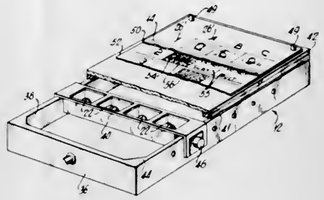


Oil-impregnated paper cables are kept dry during storage, shipment and installation by covering the cable, under the skid wire, with a sheath comprising a laminated tape of aluminum coated with plastic on both sides. The plastic seals the seam of the sheath, and as the cable is pulled into a pipe the sheath is ruptured or torn in a haphazard manner by use of pliers, about once for each turn of the reel, to create breaks in the sheath which permit rapid and thorough evacuation of the completed system and also permit normal interchange of the pipe filling oil on load cycle changes.

3,579,864
TEACHING DEVICE
Sheldon Littwin, 38-21 Garvey Place, Fairlawn, N.J., and Alexander Schure, 257 Wheatley Road, Old Westbury, N.Y.
Filed Mar. 4, 1969, Ser. No. 804,150
Int. Cl. G09b *7/06*
U.S. Cl. 35—9 **14 Claims**

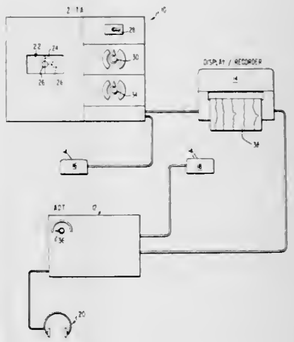
A response display system which is compatible to data processing and computer systems is described.

The device displays information as the result of a particular inquiry such as in a learning system, teaching system, a game, or a directory. The display employs a multiple-leaf answer response sheet. An intermediate surface on the



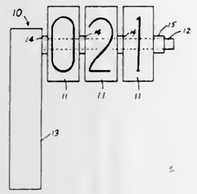
answer sheet is provided with response characters which are ordinarily concealed but may be silhouetted upon illumination by lamps placed in selected registration with the response characters. A matrix device is used to key punch data processing cards. Several embodiments are shown.

3,579,865
METHOD FOR MEASURING THE EFFECTS OF STRESS ON A MAN'S PERFORMANCE OF PRIMARY AND SECONDARY TASKS
Norman Kenneth Walker, 6613 Sulky Lane, Rockville, Md.
Filed Feb. 27, 1969, Ser. No. 802,977
Int. Cl. G09b *19/00*
U.S. Cl. 35—22 **8 Claims**



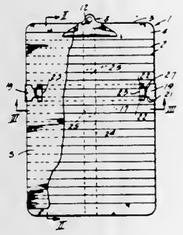
A method for measuring the effects of stress on a man's performance of a primary task, while a secondary task is also provided to be performed simultaneously by the test subject. The secondary task thus produces a "distraction stress" on the test subject thereby degrading his performance on both of the tasks. A Zero Input Tracking Analyzer (ZITA) is used as the primary task, which provides a unique tracking task that has no initial input or error source, and requires the test subject to null only his own error from his previous response after he has initiated the tracking task with his initial response. A number of variations, such as velocities and accelerations, as well as various amounts of lag or lead may be introduced into the response system. An Auditory Discrimination Task (ADT) can be used as the secondary task, to produce the "distraction stress" for the test subject while he is carrying out the primary task. This task requires that the test subject respond to the stimuli of high or low tones, presented to him by head phones, by moving a response stick forward or backward for the high and low pitch, respectively. A common display/recorder is used to record the performance on both tasks.

3,579,866
POLYBASE COUNTER
John Everett Miller, 4568 E. 45th St., Tulsa, Okla.
Filed Mar. 3, 1969, Ser. No. 804,058
Int. Cl. G09b *19/02*
U.S. Cl. 35—32 **4 Claims**



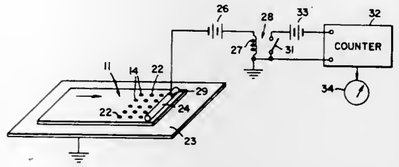
This invention relates to a simple mechanical counter to be used as an instructional aid in teaching number systems of various different bases. It consists of a plurality of prismatic-shaped or cylindrical-shaped blocks freely mounted on a shaft which extends from a handle. The lateral faces of these blocks are numbered according to the base of the number system being used—each block in a set of blocks for base two being numbered "0" and "1," each block in a set of blocks for base three being numbered "0," "1," and "2," each block in a set of blocks for base four being numbered "0," "1," "2," and "3," and so on in this manner. A set of blocks is mounted on the shaft in such a way that by rotating the blocks in the proper manner consecutive numbering in a given base number system may be shown.

3,579,867
WRITING GUIDE FOR TRAINING PURPOSES AND USE BY THE BLIND
Henry S. Kuhn, 609 Austin Ave., Park Ridge, Ill.
Filed Sept. 5, 1969, Ser. No. 855,604
Int. Cl. G09b *21/00*
U.S. Cl. 35—38 **10 Claims**



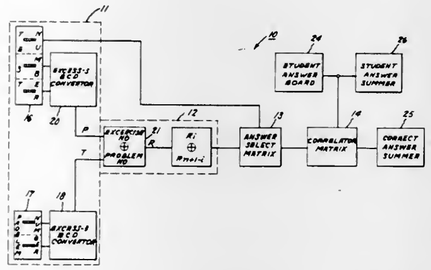
A writing guide in the form of a generally planar board, the upper face of which forms the surface on which may be disposed the paper sheet to be written on, the board having a series of parallel edges extending horizontally across at least a portion of the upper face of the board, each of which defines respective writing lines along and above which the particular line is to be disposed, with each of such edges forming an abutment at the writing line defined thereby which faces upward toward the top of the board and is operative to impart a distinct resistance to movement of a writing instrument, applied to such a paper sheet, in a downward direction below such writing line. In a preferred embodiment of the invention the writing surface between each pair of adjacent abutment-forming edges is inclined from the inner boundary of the lowermost of such pair to the outer boundary of the uppermost of such pair. Such abutments may be placed in any desired configuration to define specific writing areas on the board and means is also provided for indicating margins as well as a designated line of writing.

3,579,868
TEST SCORING ANSWER SHEET AND METHOD OF EMPLOYING SAME
Thaddeus Leroy Scott, 306 Hyde Drive, Hayward, Calif.
Filed Nov. 14, 1969, Ser. No. 876,835
Int. Cl. G09b *7/06*
U.S. Cl. 35—48 **10 Claims**



An answer sheet for automatic test scoring, and scoring method employing same which facilitate automatic scoring with apparatus of an extremely simplified nature and attendant low cost. The sheet and method are such as to eliminate the usual requirement for a master score card and associated comparison circuitry, complex programmed logic circuitry, or the like, in the scoring machine.

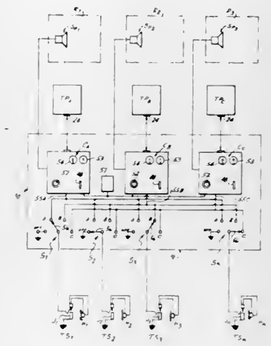
3,579,869
AUTOMATIC ANSWER CONFIRMATION SYSTEM
Terry L. Hewitt, Schenectady, N.Y., assignor to General Electric Company
Filed Sept. 2, 1969, Ser. No. 854,417
Int. Cl. G09b *7/00*
U.S. Cl. 35—48 **7 Claims**



An automatic answer confirmation system employable with a student response system is described wherein the problem and test designator numerals are logically combined to extract a single correct answer for the multiple choice question being answered. To effect this result, the problem and test designator numerals are encoded into the answer confirmation system as binary coded decimal digits and the digits are summed in two exclusive-OR stages to produce a composite digital number related to the problem being answered. The composite number then is entered into an answer select matrix for extraction of the correct answer for the problem and the correct answer is compared with the student selected choice to automatically determine the correctness of the student's choice.

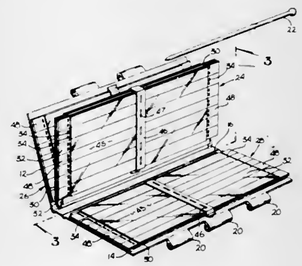
3,579,870
TEST ADMINISTERING APPARATUS
George K. Bennett, Bronxville, and Richard G. Buchanan, New York, N.Y., assignors to The Psychological Corporation, New York, N.Y.
Filed Aug. 27, 1969, Ser. No. 853,315
Int. Cl. G09b *7/00*
U.S. Cl. 35—48R **10 Claims**

A test administering apparatus has a plurality of tape playback units individually controllable by an examiner at a console to provide verbal instructions for, and to time a respective test, and the outputs of the playback units are selectively fed, as by station selector switches at the console, to any of a plurality of headphones or earpieces to be utilized by individual examinees and/or to selected loudspeakers in



examination rooms occupied by groups of examinees. An alert signal is provided from each operating playback unit to the examiner near the end of the allotted time for the respective test and the end of such allotted time is also signalled to the examiner as well as to each examinee taking the test.

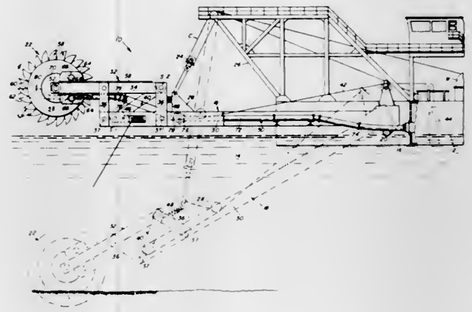
3,579,871
RECORD BOOK
Lloyd H. Eddington, 4330 Kling St., Burbank, Calif.
Filed July 24, 1969, Ser. No. 844,460
Int. Cl. B43l *1/00*
U.S. Cl. 35—66 **10 Claims**



A record book comprising a plurality of leaves wherein each leaf is centrally divided in the transverse direction with separate writing sections located on each side of the division. Each writing section includes a series of longitudinal separate writing spaces, each space having a wax backing with an opaque writing strip covering the backing and a clear plastic outside cover over the writing strip. The writing strip of each space can be removed from in contact with the wax backing. The stylus is to be retained when not in use within a hinge connection which maintains the entire book in the closed, not-in-use position.

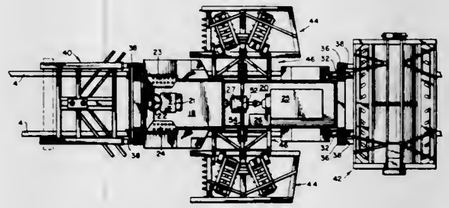
3,579,872
DREDGING APPARATUS WITH SURGE COMPENSATING MEANS
Robert J. Jantzen, Baltimore, Md., assignor to Ocean Science and Engineering, Inc., Washington, D.C.
Filed Nov. 5, 1968, Ser. No. 773,613
Int. Cl. E02f *3/90*
U.S. Cl. 37—66 **8 Claims**

A dredging system including a floating vessel, a ladder pivotally connected to the vessel and capable of being lowered to selected angular positions with respect to the vessel, an excavator at the free end of the ladder for digging and removing material, and a surge compensator on the ladder



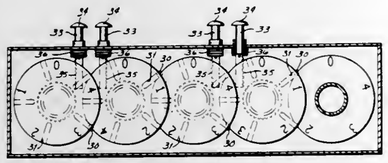
for adjusting the length of the ladder in response to changes in distance between the vessel and the material being dredged.

3,579,873
RAILWAY BALLAST WORKING APPARATUS
John Knox Kershaw, Southport, Ind., assignor to The Marmon Group Inc., Chicago, Ill.
Filed Feb. 14, 1968, Ser. No. 705,421
Int. Cl. E01b *27/02*
U.S. Cl. 37—105 **15 Claims**



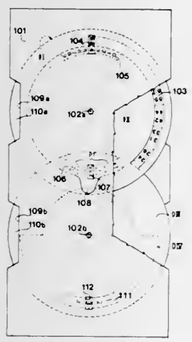
A self-propelled road and rail vehicle has four retractable rail wheels and has four pneumatic-tired drive wheels which are used for road travel and which ride on the rails during rail travel to produce high tractive effort for driving various roadbed maintenance and rehabilitation equipment. Such equipment may include a ballast distributing plow carried at the front of the vehicle and a track broom at the rear carried by head blocks on the vehicle, and in particular, has a side ballast-working wing mounted on an adjustable carrier at each side of the vehicle. All are controlled hydraulically from the vehicle cab, and have operating positions for use on the roadbed and transport positions within limited road travel dimensions. Each ballast-working wing has front scarifying teeth to break up compacted ballast on a side bank of the roadbed, two sets of discing elements to work and redistribute the loosened ballast of the side bank, and a mold board behind the disc units for reshaping the side banks. Each such wing is supported from the vehicle frame by an adjustable carrier providing both lateral and tilting adjustment over a wide range, and movement between operating and travel position, and the wing is readily removable for replacement by other bank-dressing units.

3,579,874
EDUCATIONAL DEVICE FOR TRAINING IN MATHEMATICS
Thomas B. Smith, 672 Jefferson St., Ste. Genevieve, Mo., and Raymond H. Swassing, Jr., 35 Northwood Apts., Storrs, Conn.
Filed Jan. 24, 1969, Ser. No. 793,681
Int. Cl. G09b *19/02;* **G06c** *27/00*
U.S. Cl. 35—32 **3 Claims**



An educational device for training in mathematics embodied in a housing having a series of disc structures rotatably mounted therein, each structure including a rotatable axially aligned disc having a forward facing disclosing a sequence of numerical values, usually mathematical numbers contained in select bases other than only defined in the decimal system; the various disc structures cooperate to provide for rearrangement in sequence of the numerical values of the base system under investigation by incorporating catch means for effecting a degree of limited rotation of one disc upon rotation of the adjacent disc.

3,579,875
APPARATUS FOR THE SYSTEMATIC CORRECTION AND SELECTIVE APPRECIATION OF TEACHING TESTS
Pierre J. Dubost, 262, Avenue Daumesnil, 75 Paris, and Henry Perret, 7, Rue des Freres Lumiere, 92 Rueil-Malmaison, France
Filed Dec. 20, 1968, Ser. No. 785,709
Claims priority, application France, Feb. 1, 1968, 138,246
Int. Cl. G09b *19/08*
U.S. Cl. 35—48 **14 Claims**

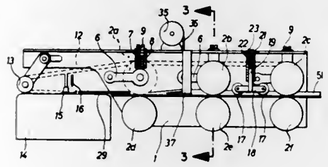


Apparatus for systematic correction and assigning marks for teaching tests comprising a case having windows. Codes carried by four rotary discs mounted in the case can be caused to be displayed in the windows by rotation of the discs. The codes comprise codes of partial identification of questions, codes of appraisement of possible answers to each question, codes indicating the correct answer, codes indicating the value of the various questions, which complete the identification of each question, codes indicating the degree of difficulty of the test, as many codes of choice as there are possible answers to each question, codes of the marks assigned to the various answers, and a code corresponding to the marks given to the chosen answer.

ERRATA

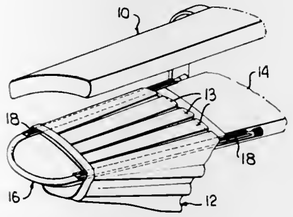
For Classes 37—66 and 37—105 see:
Patents Nos. 3,579,872 and 3,579,873

3,579,876
APPARATUS FOR FOLDING, FEEDING AND PRESSING PIECES OF FABRIC MATERIAL
Hans Freermann, Ochtrup, Germany, assignor to Firma Carl Schmale, Ochtrup Westphalia, Germany
Filed Dec. 29, 1967, Ser. No. 694,707
Claims priority, application Germany, Dec. 29, 1966, Sept. 9, 1967, 40,033;41,278
Int. Cl. D06f *61/06;, 63/02, 69/00*
U.S. Cl. 38—2 **18 Claims**



Apparatus for automatically hemming the edges of pieces of fabric material. The apparatus includes both a mechanism for use in machinery for folding over the edge of a piece of material and a mechanism for feeding the material into and out of the folding mechanism and for pressing the material in the area of the edge before as well as after its edge is folded.

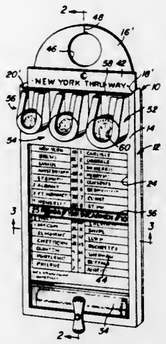
3,579,877
DEVICE FOR HOLDING PLEATED MATERIAL
Aaron C. Bray, Jr., Evans Drive, P.O. Box 203, Houston, Miss.
Filed Aug. 2, 1968, Ser. No. 749,801
Int. Cl. D06f *71/40*
U.S. Cl. 38—12 **8 Claims**



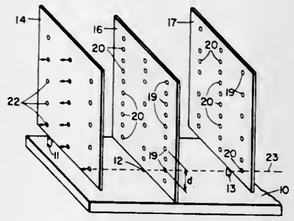
A device for facilitating pressing of pleated garments. A U-shaped frame is attached to the work surface of a pressing buck or ironing board. The frame has narrow strips of friction material affixed thereto so that when a pleated garment is placed over the work surface the friction material engages the garment and keeps the pleats from falling out.

3,579,878
CARD RETAINER
Anthony L. Griffin, 107 Division St., Amsterdam, N.Y., and Earl G. Chetwynd, 6 Steele Ave., Gloversville, N.Y.
Filed Feb. 28, 1969, Ser. No. 803,310
Int. Cl. G09f *3/18*
U.S. Cl. 40—10 **9 Claims**

An envelope-type enclosure tor receiving a panellike card having indicia on at least one side thereof. The enclosure includes structure adapting it to be hung on a suitable support, a window in one side thereof with which the indicia of the card may be registered and coin retaining pockets for retaining a plurality of different value coins to be paid out in tolls.



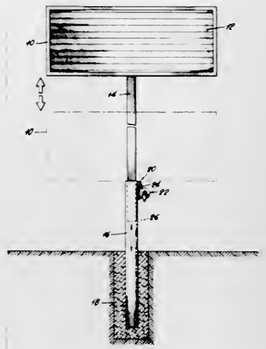
3,579,879
FLUIDIC CHARACTER DISPLAY DEVICE
Walter E. D. Samuels, Cleveland Heights, Ohio, assignor to Corning Glass Works, Corning, N.Y.
Filed July 22, 1969, Ser. No. 843,483
Int. Cl. G09f *11/00*
U.S. Cl. 40—28 **9 Claims**



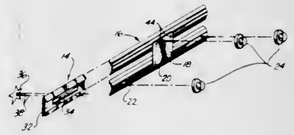
A plurality of stacked movable slides is arranged such that a small movement of any one thereof from an inactivated position to an activated position will align information containing apertures of the moved slide with base apertures of the remaining slides to allow light to pass through the entire stack of slides and indicate a character that is outlined by the information apertures of the moved slide. A pair of pneumatic cylinders which are disposed at opposite ends of each of the slides move the slides between their inactivated and activated positions. A masking slide, which is moved from its inactivated to its activated position concurrently with the movement of any one of the plurality of slides to its activated position, prevents the display of any light when all of the plurality of slides are in their inactivated position.

3,579,880
CAROUSEL SIGN
Edward L. Murphy, 2500 Farrier Place, Owensboro, Ky.
Filed June 16, 1969, Ser. No. 833,623
Int. Cl. G09f *11/10*
U.S. Cl. 40—33 **10 Claims**

A system for displaying a plurality of messages comprising a rotatable sign supporting member for mounting a plurality of signs. The supporting member is capable of rotation about a vertical shaft and may be raised for viewing or lowered to ground level for facilitating the change of messages.

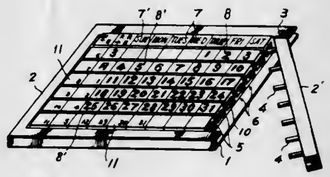


3,579,881
MILITARY RIBBON HOLDER
Gene F. Cherry, 331 Fountain Ave., Redlands, Calif.
Filed Feb. 14, 1969, Ser. No. 799,195
Int. Cl. A44c *3/00*
U.S. Cl. 40—1.5 **4 Claims**



One or more military campaign ribbons are mounted on the front of a uniform by sliding them lengthwise along an elongated channel-shaped metallic strip having a base portion with a pair of forwardly diverging sides. The base is arcuate in cross section, and the sides have arcuate rib portions with flanges adapted to slidably receive the ribbon.

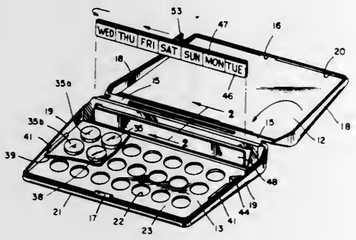
3,579,882
PERPETUAL CALENDER
Yoshio Miyahune, No. 238, Kitakase, Kawasaki-shi, Kanagawa-Ken, Japan
Filed Mar. 24, 1969, Ser. No. 809,893
Claims priority, application Japan, Apr. 17, 1968, 43/31257
Int. Cl. G09d *3/02*
U.S. Cl. 40—107 **2 Claims**



A mechanical type of perpetual calendar utilizing laterally interlocking blocks having both faces of different color and which are arranged by being moved and turned upside down for the purpose of distinguishing in appearance the week days from flag days or red letter days. A frame holder is provided to slidably receive the blocks in rows, and has a side

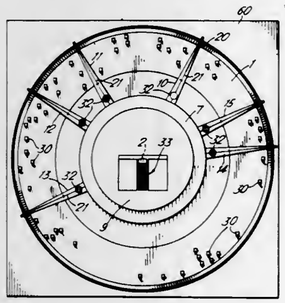
access frame member providing access for the blocks, and which frame member interlocks with the adjacent end blocks of the respective rows placed within the frame to hold same in a stabilized condition.

3,579,883
PILL DISPENSER WITH INDICATING MEANS
Thomas H. Hayes, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed Feb. 24, 1969, Ser. No. 801,543
Int. Cl. G09f *9/00*
U.S. Cl. 40—107 **6 Claims**



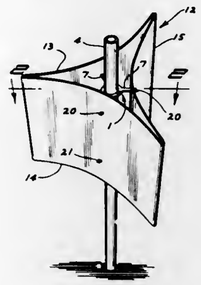
A pill dispenser with indicating means in the form of a flexible strip having a plurality of day indicia which are selectively adjustable to align any set of a predetermined number of successive indicia with a like number of columns of pills, thereby providing an indication of when each pill is to be taken.

3,579,884
FORWARD PLANNING APPARATUS
Nicholas P. Holwell Bray, Penny Farm, near Sherborne England
Filed Sept. 27, 1968, Ser. No. 763,079
Claims priority, application Great Britain, Oct. 13, 1967, Jan. 22, 1968, 46,796/67;3,303/68
Int. Cl. G09t *11/00*
U.S. Cl. 40—110 **6 Claims**



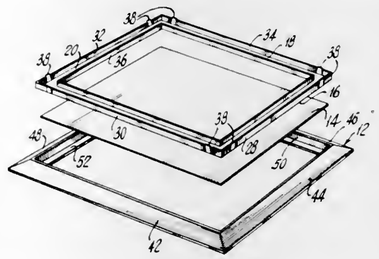
A forward planning apparatus comprising in combination a time scale with a plurality of pointers movable together over it in accordance with the passage of time, the pointers being set to indicate given periods of time between them and each representing a stage of an enterprise, and at least one multisided element representing a unit of the enterprise, the sides of said element each bearing an indication for one stage of the enterprise, such element being capable of application to the time scale with any side thereof in a given visible position to indicate the stage of the enterprise in hand.

3,579,885
ADVERTISING DISPLAY SUPPORT
Peter B. Iverson, Excelsior, Minn., assignor to Postmark Corporation, Minneapolis, Minn.
Filed Jan. 31, 1969, Ser. No. 795,614
Int. Cl. G09f *7/18*
U.S. Cl. 40—145 **6 Claims**



A support structure for an advertising display in the form of a spider member having a plurality of notched legs for supportably engaging the sidewalls of a multisided advertising display through apertures therein, the spider member being mounted on an upright post or suspended by an overhead string. The spider member preferably has a ring-shaped central body portion within which an adapter may be removably inserted for attachment to a string or to the top end of a tubular support post.

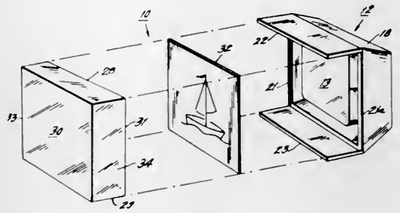
3,579,886
PICTURE FRAME MOUNTING CONSTRUCTION
George T. Hughes, Newburgh, N.Y., assignor to Ovitron Corporation, Newburgh, N.Y.
Filed May 4, 1970, Ser. No. 34,140
Int. Cl. G09F *1/12*
U.S. Cl. 40—152 **5 Claims**



A low-cost picture frame assembly includes a stretch frame onto which a print, lithograph or the like is initially secured such as by an adhesive substance provided over at least a portion of one surface of the stretch frame. The inner frame having the print secured thereto is frictionally engaged by means of locking means provided on one of the frames, to thereby unite the two frames into the desired assembly.

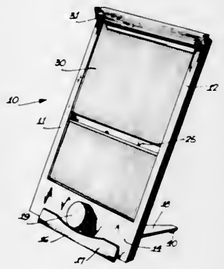
3,579,887
DESK FRAME
Gunter Rochelt, 7 Schulinstr. 1110, Ulm, Germany
Filed Jan. 7, 1969, Ser. No. 789,466
Int. Cl. G09f *1/12*
U.S. Cl. 40—152.1 **8 Claims**

A frame for pictures and the like comprised of a transparent member and a lightweight supporting member having a much smaller total mass and weight than the transparent member. The supporting member positions and frames the transparent member on two opposite parallel sides while framing the picture inserted within the support member on all four sides so as to completely conceal the sides of the picture when the frame is fully assembled. The support member is provided with a recess along the rear surface to facilitate hanging of the frame upon a wall or other surface and is further provided with diagonally aligned support surfaces which together with the disposition of the center of gravity of the assembled frame, enables the frame to be supported



diagonally relative to a support surface upon any of the diagonal aligned surfaces of the support member. In addition, the two opposite parallel sides of the support member which embrace the transparent member as well as the two exposed sides of the transparent member may be optionally employed as supporting surfaces for supporting the frame assembly in a vertically aligned fashion upon a suitable supporting surface.

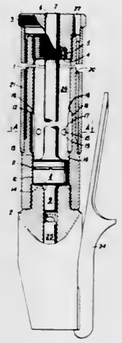
3,579,888
COPY HOLDER
Clifford Henry Burnham, 17 Sherwood Ave., Scarborough, Ontario, Canada
Filed Dec. 6, 1968, Ser. No. 781,735
Int. Cl. B41j *11/64*
U.S. Cl. 40—356 **5 Claims**



A copyholder for holding sheets of material, such as paper, for the copying of information therefrom, for example by a typist. The holder has a rectangular frame slightly larger than the sheets to be held, a stand for supporting the frame upright, and a bar extending across the frame to underline the line being copied. A knob, pulley and cord arrangement move the bar up and down on rotation of the knob. A resiliently biased member is positioned at the top of the frame for gripping the top of the sheet.

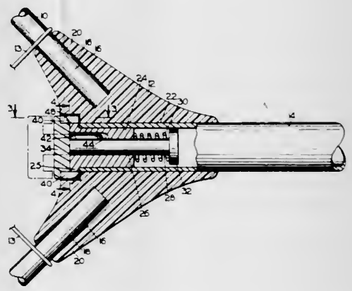
3,579,889
ANESTHETIZING GUN FOR USE IN SLAUGHTERING ANIMALS
Adolf Pallich, Brno, Czechoslovakia, assignor to Zbrojovka, narodni podnik, Brno, Czechoslovakia
Filed Mar. 10, 1969, Ser. No. 805,516
Claims priority, application Czechoslovakia, Mar. 18, 1968, 2084-68
Int. Cl. F41c *3/00;* **A22b** *3/02*
U.S. Cl. 42—1 **6 Claims**

An anesthetizing gun to be used in connection with the slaughtering of animals. The gun has a barrel which at its muzzle end is provided with a bore through which an anesthetizing instrument is axially guided. A piston is fixed to the rear end of the instrument and is slidable in the gun barrel while a suitable structure behind the piston supplies a gas under pressure to drive the piston forwardly to displace the instrument forwardly beyond the muzzle along its working stroke. The barrel is formed with passages communicating with the interior of the barrel and having front and rear ends displaced from each other along the barrel axis by a distance greater than the axial length of the piston, with the latter moving along these passages during part of the stroke of the



piston, so that the gas under pressure can flow through these passages from the rear to the front of the piston within the barrel and also through these passages from the front to the rear of the piston within the barrel. The barrel has at least one discharge opening through which the gas can escape, but this opening is closed by the piston itself when the gas flows through the passages around the piston.

3,579,890
COLLAPSIBLE FISH NET
James D. Maxwell, 11001 S.E. 19th St., Vancouver, Wash.
Filed June 2, 1969, Ser. No. 829,519
Int. Cl. A01k *77/00*
U.S. Cl. 43—12 **5 Claims**



A collapsible fish net including a hoop for supporting a flexible, mesh basket portion and also including a neck member secured to the hoop. The neck member has an opening therethrough which extends radially relative to the hoop, and a handle is slidably mounted in such opening for moving a portion thereof into the hoop to reduce the overall size of the net. Latch means are connected between the neck member and the handle and include a latch pin in the handle engageable with a bayonet slot in the neck member whereby the latch means are moved into a locking position for securing the handle in a use condition by a combination of relative axial movement and axial rotation of the neck member and handle. A lock member is used in the latch means to positively hold the neck member and handle latched together. The

hoop has disconnected ends secured to the neck member by frictional engagement in bores in the neck member. The hoop is made of springy material, and the disconnected ends of the hoop in the manufacture thereof are disposed apart a distance different than the distance between the bores in the neck member so that the frictional engagement of the ends of the hoop in the bores is accomplished by a springing action developed from springing the ends of the hoop to a spacing to fit in the bores.

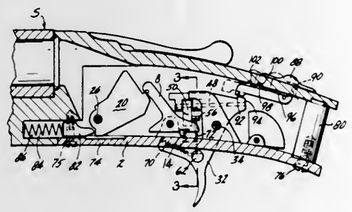
ERRATUM

For Class 42—84 see:
Patent No. 3,580,113

3,579,891
SINGLE SELECTIVE TRIGGER SYSTEM FOR DOUBLE BARREL FIREARMS

John J. Kuzma, North Haven, and Robert I. Gawrych, Killingworth, Conn., assignors to Olin Mathieson Chemical Corporation

Filed Feb. 14, 1969, Ser. No. 799,217
Int. Cl. F41c *19/00*
U.S. Cl. 42—42 **2 Claims**



A trigger system for double barrel firearms having a pair of hammers and a single trigger, a selector actuated by the trigger and operable to release only one of the hammers from its cocked position while permitting the other hammer to remain undisturbed in its cocked position. The selector then being operable to release the other hammer from its cocked position upon a second actuation of the trigger.

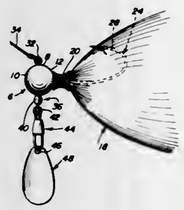
ERRATUM

For Class 43—12 see:
Patent No. 3,579,890

3,579,892
BEAD-HEAD FLY WITH DANGLING SPINNER

James O. Olvey, Sr., P.O. Box 287, La Follette, Tenn.

Filed Aug. 8, 1969, Ser. No. 848,493
Int. Cl. A01k *85/00*
U.S. Cl. 43—42.11 **9 Claims**

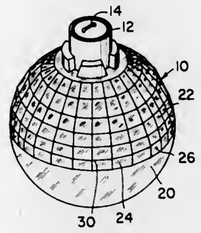


A bead-head fly lure for jigging, casting or trolling for game fish, comprising a molded bead head of the weight desired. The forward right-angled end of the shank of the hook is embedded in the upper half-portion of the head in a manner to expose the line eye. The hook end of the shank projects beyond a flared neck on the rearward side of the head to accommodate either live or artificial bait, usually a bucktail. A swivel on the bottom of the head is equipped with a snap fastener for a dangling spinner.

3,579,893
REFLECTING FISHING FLOAT

Henry S. Wolfe, Beaver Hill Bldg., Jenkintown, Pa.

Filed Dec. 23, 1968, Ser. No. 786,203
Int. Cl. A01k *93/00*
U.S. Cl. 43—17.5 **1 Claim**



A reflecting fishing float comprising a buoyant body member preferably of generally spherical configuration having an upper hemispherical portion provided with a plurality of flat, angularly disposed reflecting surfaces thereon adapted to reflect rays from the sun directly to a viewer. The lower hemispherical portion has a smooth external configuration. A plunger means extends axially through the upper hemispherical portion and has line-attaching means thereon.

3,579,894
FISH-IMPALING AND GRAPPLING IMPLEMENT

Ephraim Henry Kidder, 617 Selma, Cadillac, Mich.

Filed Mar. 24, 1969, Ser. No. 809,513
Int. Cl. A01k *81/04*
U.S. Cl. 43—6 **8 Claims**

A fish-impaling, grappling and landing implement embodying self-contained features which well serve the purposes for which they have been devised. An elongated handle embodies compact and convenient telescoping latch-retained sections. The forward end embodies an axial spearing prong and openable and closable grappling jaws provided with inwardly angled fish-impaling tines. A shiftable latch-retained sleeve provides a ferrule which releasably fastens pivoted shank portions of the jaws in fish grappling position.

3,579,895
ARTIFICIAL FISH LURE AND METHOD OF MAKING SAME

Vernon B. Orn, 12733 S.E. 163rd, Renton, Wash., and Richard E. Cook, 9821 N.E. 16th, Bellevue, Wash.

Filed Oct. 21, 1968, Ser. No. 769,238
Int. Cl. A01k *85/00*
U.S. Cl. 43—17.6 **19 Claims**

Artificial fish lures, such as simulated bait fish eggs, characterized by a substantially homogeneous body form, either as single spheres or as fused clusters. A typical formulation involves highly plasticized polyvinyl chloride resin with a cured Shore-A-Durometer hardness of 3—10, and with fish-attracting odorant and plasticizer, such as salmon oil, dispersed throughout each spherical egg and continually forming a milky emulsion at the surface when the egg is exposed to water. A typical method of forming the simulated

eggs comprises introducing unfused plastisol into a hot liquid bath of a regulated specific gravity so that each plastisol droplet enters the bath and drops toward the bottom of the bath until its temperature increases sufficiently to lower its specific gravity whereupon each droplet rises to the surface of the bath as a substantially spherical body. The spherical bodies are then removed and cooled, either singly or as clusters.

3,579,896
SPRING-OPERATED FISHING ROD DEVICE

Thomas Flottorp, 207 Argyle St., Regina, Saskatchewan, Canada

Filed July 18, 1969, Ser. No. 842,919
Int. Cl. A01k *91/02*
U.S. Cl. 43—19 **2 Claims**

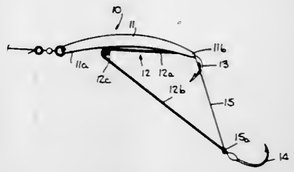
A device consisting of a tension spring secured by one end thereof to a rod and having an ejector rod extending through the spring to the other end, terminating in a finger-engaging portion so that the spring can be extended, thus drawing the ejector through the spring. A socket is provided on the other end of the ejector rod within which a lure assembly may be engaged so that when the spring is released, the ejector rod is moved forwardly thus ejecting the lure in axial alignment with the coil spring.

3,579,897
FISH-CATCHING APPARATUS WITH SNAP-ACTUATABLE HOOKS

Dean V. Babst, 31 Linden Road, Ho-Ho-Kus, N.J.

Filed Apr. 18, 1969, Ser. No. 817,524
Int. Cl. A01k *83/00*
U.S. Cl. 43—35 **5 Claims**

Fish-catching apparatus including a spring mechanism having a pair of spring legs with fish hooks extending toward each other from each of the legs. The spring mechanism biases the legs toward each other and a trigger is fixed relative to one leg and releasably fixable relative to the other leg for holding the legs and hooks apart from each other against the bias of the spring. When a fish bites at the apparatus the fish will strike the trigger moving the trigger from between the spring legs to allow the legs and hooks to move toward

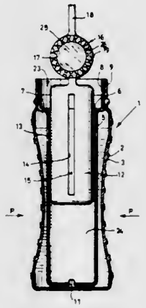


each other so the fish biting at the apparatus will be caught on at least one of the hooks.

3,579,898
BUBBLE BLOWING DEVICE

Rolf Hein, Gartenstrasse 85, Tubingen, Germany

Filed Jan. 21, 1969, Ser. No. 792,723
Claims priority, application Germany, Jan. 25, 1968, P 16 78 342.9
Int. Cl. A63h *33/28*
U.S. Cl. 46—7 **10 Claims**

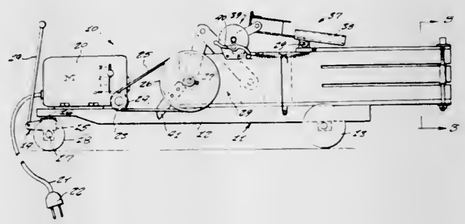


A compact bubble blowing device wherein a film-forming bubble solution and the member from which the bubbles are blown, are contained in one unit. The member is projected out of, and retracted into, the solution through a singlehanded operation of the device.

3,579,899
TOY HAY BALER

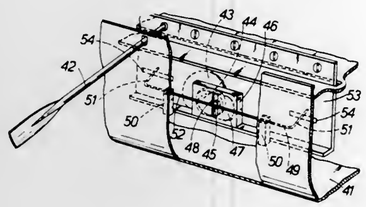
Amos F. Hannah, Hollister, Calif. (Star Rte. Box 239, Snelling, Calif. 95369)

Filed Sept. 12, 1968, Ser. No. 759,415
Int. Cl. A63h *33/30*
U.S. Cl. 46—39 **4 Claims**



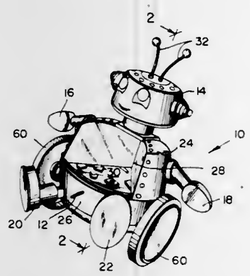
A mechanical toy for baling hay, the toy including operative mechanism for feeding and compressing hay material within a press so to form rectangular configurated hay bales which are tied together so to retain their shape.

3,579,900
TOY WATERCRAFT
David Argent Brown, 46 Willway Ave., Richmond, Va.
Filed Dec. 30, 1968, Ser. No. 787,781
Claims priority, application Great Britain, Jan. 3, 1968, May 10, 1968, 461/68;22272/68
Int. Cl. A63h *23/02*
U.S. Cl. 46—93 **13 Claims**



A toy watercraft propelled by a rowing action, The cars are driven by a motor through a double cam device which imparts reciprocating horizontal and vertical components of motion to the oars so that they move in oblong paths, the longest axis of the oblong being parallel to the water surface.

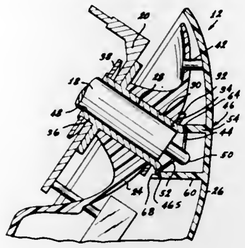
3,579,901
KALEIDOSCOPE PULL-TOY CONSTRUCTION
Leslie Perhacs, Jr., Topanga, Calif., assignor to Cragstan Industries, Inc., New York, N.Y.
Filed May 28, 1969, Ser. No. 828,633
Int. Cl. A63h *11/10*
U.S. Cl. 46—103 **19 Claims**



The present invention pertains to a pull-toy construction employing a horizontally disposed kaleidoscope assembly wherein there is provided means for translating the rotational movement of the wheels of the toy about a horizontal axis into rotational movement of the kaleidoscope assembly about a vertical axis, and including means for translating the wheel rotation about a horizontal axis into movement of other parts of the toy with various movement patterns in various planes of motion, and for also producing audible effects in combination therewith.

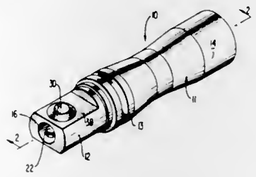
3,579,902
DOLL STRUCTURE INCLUDING APPENDAGE WITH FASTENER TRAPPED THEREIN FOR CONNECTING TO TORSO
Brian G. Osborne, Manhattan Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.
Filed Mar. 5, 1969, Ser. No. 804,503
Int. Cl. A63h *11/00*
U.S. Cl. 46—149 **4 Claims**

A walking doll wherein each leg can be attached to the torso after the leg has been completely finished, to eliminate extensive handling of the entire doll. The leg has two housing halves, one formed with a mount for holding a fastener which locks onto a torso shaft pushed into the leg, and the other



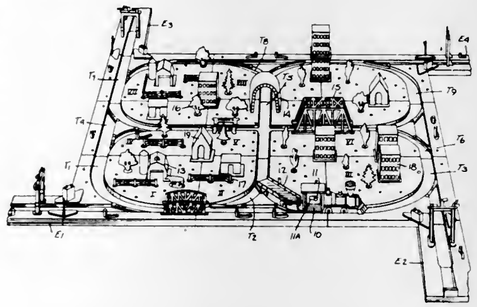
half constructed to trap the fastener on the mount until the torso shaft is inserted into the leg.

3,579,903
ANIMAL CALL
Johnny E. Stewart, P.O. Box 7765, Waco, Tex.
Filed Sept. 9, 1968, Ser. No. 758,329
Int. Cl. A63h *5/00*
U.S. Cl. 46—180 **9 Claims**



This disclosure relates to an animal call of the type adapted to simulate the sounds of game birds and other wild life, and includes a tubular body through which air is blown to vibrate a reed for generating sound waves and a depressible plunger for contacting the reed to vary the pitch as desired, the plunger being constructed of relatively soft resilient material and being disposed immediately adjacent a mouthpiece end of the tubular body whereupon the plunger can be depressed by a user's mouth, lips or teeth thus leaving his hands free to manipulate a gun, camera or other instrument.

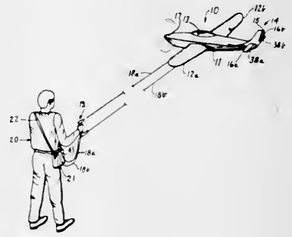
3,579,904
TOY RAILROAD ASSEMBLY
Robert Genin, Scarsdale, N.Y., assignor to Child Guidance Toys, Inc., Bronx, N.Y.
Filed July 7, 1969, Ser. No. 839,180
Int. Cl. A63h *19/36*
U.S. Cl. 46—216 **8 Claims**



A versatile toy railroad assembly in which various track layouts may be formed by different arrangements of square boards, each board having a depressed track section therein adapted to communicate with track sections on contiguous

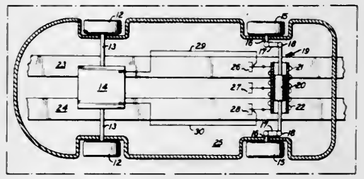
boards to define a track layout whose pattern is determined by the manner in which the boards are interrelated. The boards are also provided with peg holes adapted to receive the supporting pegs of diversified scenic elements, such that by straddling adjacent boards with scenic elements, the boards are interlocked thereby to maintain a predetermined layout.

3,579,905
AIRCRAFT, BATTERY AND BATTERY-CARRYING MEANS, WHEREIN THE CONDUCTIVE WIRES SERVE AS MANIPULATING WIRES
James T. Radford, 1219 Van Buren, Houston, Tex., and Ronald A. Mizrany, 4321 Greeley, Houston, Tex.
Filed Oct. 16, 1967, Ser. No. 675,417
Int. Cl. A63h *27/04*
U.S. Cl. 46—244 **7 Claims**



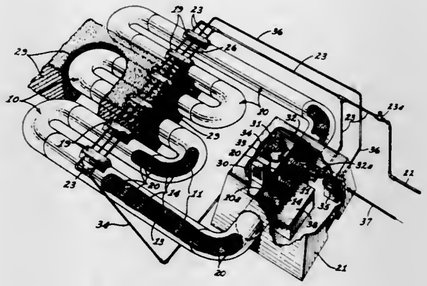
A fractional horse power motor in a toy aircraft has slack conductive wires therefrom connected to opposite ends of the crossarm of a pivotally mounted bellcrank with its short arm connected to control the elevator. From the crossarm the wires extend for operative distance to a handle, including a switch and thence to a battery housed in a case having a shoulder strap. A single operator needs only to hold the handle and to carry the power source, as a battery, at which the wires terminate; thus pressing the switch drives the engine and manipulating the wires for bellcrank movement controls flight elevation.

3,579,906
MINIATURE STEERABLE VEHICLE AND TRACK SYSTEM THEREFOR
David H. La Forge, R.R. 1, Box 648, Makawao, Hawaii
Filed Dec. 19, 1969, Ser. No. 886,572
Int. Cl. A63h *33/26*
U.S. Cl. 46—244 **30 Claims**



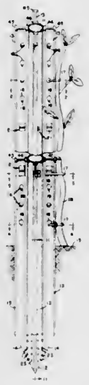
A miniature four-wheeled vehicle is provided with a solenoid having a linearly movable armature for turning the steering wheels in response to electrical impulses received by a set of contact brushes on the vehicle which selectively engages the conductive track system on a supporting surface which also supplies power to the vehicle and includes conductive guiding areas on the surface for steering the vehicle through a switch in the track system.

3,579,907
AUTOMATED CONTROLLED ENVIRONMENT FOR CONTINUOUS PRODUCTION OF PLANT LIFE
Rodney J. Graves, 119 E. Hancock, Williams, Ariz.
Filed Oct. 3, 1969, Ser. No. 863,620
Int. Cl. A01g *9/18, 31/00*
U.S. Cl. 47—17 **7 Claims**



An automated controlled environment system for the continuous production of plants in which there is provided a cool, low-light environmental unit for the production of hydroponic oat, barley and the like grass plants.

3,579,908
SUPPORT FOR GROWING PLANTS
John Robert Morgan, Palmer Hill Road, Old Greenwich, Conn.
Filed May 12, 1969, Ser. No. 823,597
Int. Cl. A01g *17/06;* **B05b** *13/02*
U.S. Cl. 47—45 **15 Claims**

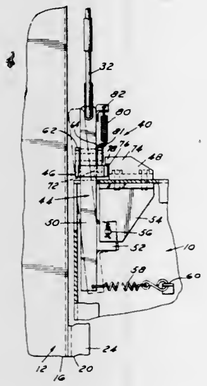


Plant support devices are provided in the form of a multiflanged tubular member having apertures in the flanges to receive tie means, such as string or rope. One end of the device is conical and the flanges are beveled to facilitate driving it in the ground. Apertures are provided in the conical end to permit liquid placed in the tubular section to drain slowly outward into the ground adjacent plant roots. An elaborate support system such as for vines may be provided by connecting a plurality of such devices together with tubular branch connectors. Modifications include outlet openings along the length of horizontal tubes to permit spray patterns of liquid introduced through a branch of one of the branch connectors. Various other modifications are also provided.

3,579,909
BALANCED DOOR
Louis L. Schacht, New York, and Ralph Turner, Queens County, N.Y., assignors to Schacht Associates, Inc., Bronx, N.Y.
Filed July 16, 1969, Ser. No. 842,151
Int. Cl. E05d *15/30*
U.S. Cl. 49—252 **3 Claims**

A balanced door, namely, a door which swings on upper and lower arms which are connected thereto and to a pivotally movably vertical torque rod, is provided with a door check and closer device, the arrangement being such that the door check and closer device can be readily installed through the top of the door and readily removed through the top of the door, when the door is opened and tilted in its own plane in a direction away from the torque rod, thereby making it unnecessary to remove the door from the door frame to install or remove the door check and closer device. The connections between the door and said arms are within the door thus eliminating the pivot projections referred to in the art as "blisters" or knuckles.

3,579,910
LOCKING MEANS FOR A VERTICALLY MOVABLE DOOR
Allan E. Wetter, Bloomfield Hills, Mich., assignor to Byrne Doors, Inc., Ferndale, Mich.
Filed Mar. 27, 1969, Ser. No. 811,175
Int. Cl. E05d *17/00*
U.S. Cl. 49—322 **11 Claims**

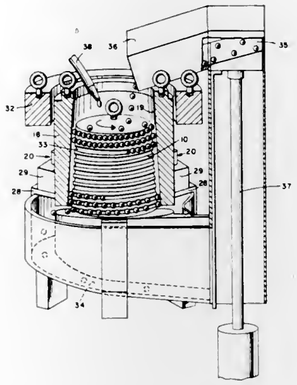


Safety latch means for locking a vertically movable door against accidental descent. A latch carried by the door has a notch which normally freely receives a guide angle flange extending along the path of door movement. The latch turns or cocks to cause the notch to bind upon the flange and lock the door against accidental descent in response to the failure of the cable.

ERRATUM

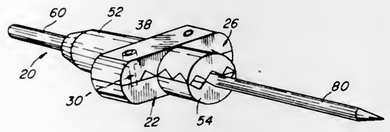
For Class 49—394 see:
Patent No. 3,579,934

3,579,911
BALL BEARING LAPPING MACHINE
Floyd Steinmetz, 205 W. Timonium Road, Timonium, Md.
Filed June 5, 1968, Ser. No. 734,683
Int. Cl. B24b *7/00, 9/00*
U.S. Cl. 51—3 **8 Claims**



A ball bearing lapping machine having members with relatively rotatable concentric conical portions, one of the conical portions provided with a spiral groove, a ball feed device for depositing the ball bearings to be lapped at the top of the members, the ball bearings, entering the spiral groove and rolled therealong between the members upon rotation of one member with respect to the other, a receptor to receive the ball bearings as they are discharged upon completion of their rolling course through the spiral groove and an elevator for returning the ball bearings from the receptor to the ball feed device for recycling the ball bearings through the machine. A means to supply lapping compound to space between the conical members and the ball bearings therein is also provided.

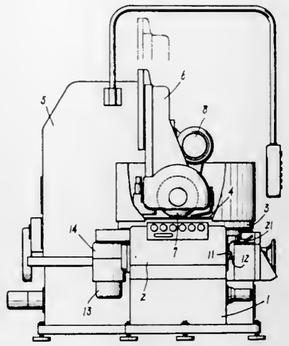
3,579,912
UNIVERSAL CLAMP FOR ABRASIVE TOOL
Walter B. Panko, Chicago, and Julius P. Steindler, Wilmette, Ill., assignors to Engis Equipment Company, Morton Grove, Ill.
Filed Apr. 25, 1969, Ser. No. 819,244
Int. Cl. B24b *7/00, 9/00*
U.S. Cl. 51—59SS **2 Claims**



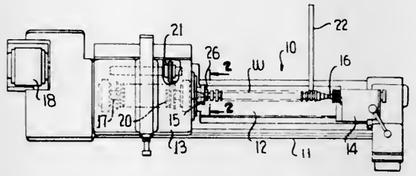
A universal clamp having specially formed gripping faces and adapted to hold lapping rods and lapping sticks of various diameters as well as abrasive stones and other abrasive tools in any position of use.

3,579,913
HYDROELECTRICAL CONTROL FOR A ROTARY SURFACE GRINDER
Kinichiro Suzuki, Tokyo, Japan, assignor to Sansei Manufacturing Co., Ltd., Minato-ku, Tokyo, Japan
Filed Dec. 12, 1968, Ser. No. 783,345
Int. Cl. B24b *7/02*
U.S. Cl. 51—95 **1 Claim**

Hydroelectrical control for a rotary surface grinder having a table driven by an electric motor for its controlled revolution and by a hydraulic system for its reciprocal movement correlated with the controlled revolution.



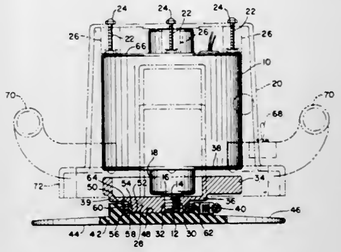
3,579,914
WORK DRIVING DEVICE
Ralph E. Price, Waynesboro, Pa., assignor to Landis Tool Company, Waynesboro, Pa.
Filed July 12, 1968, Ser. No. 744,350
Int. Cl. B24b *17/02;* **B25b** *41/06*
U.S. Cl. 51—101 **12 Claims**



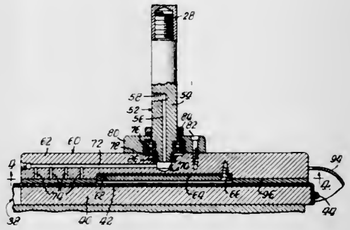
This disclosure relates to a work driving apparatus, particularly for a cam contour grinder, for applying a driving torque at two angularly spaced points on a workpiece so that the entire force transmitted by the work driving apparatus acts to turn the workpiece and there is no force to cause radial displacement of the workpiece. The work driving apparatus is particularly adapted for use in conjunction with a workpiece having a flange at one end and an orienting hole in the flange. The work driving apparatus includes a driving block which carries a locating pin which is proportioned for a close fit in the hole in the workpiece flange to maintain the workpiece in a predetermined oriented position during the grinding thereof. The driving block is mounted for floating movement so as to compensate for variations in workpieces and is pivotable about the axis of the locating pin to engage a jaw carried thereby with the workpiece at a point remote from the locating pin.

3,579,915
FREE ORBITAL SURFACE TREATING TOOL
James Glenn Satterthwaite, 1 Dogwood Trail, Chesapeake, Va., and Waverly Hope Wilcox, 1214 Sheppard Ave., Norfolk, Va.
Filed Nov. 8, 1968, Ser. No. 774,393
Int. Cl. B24b *23/02*
U.S. Cl. 51—120 **10 Claims**

There is provided a tool for treatment or modification of a surface, for example, buffing, having drive means including a shaft, an eccentric member secured to the shaft and rotatable therewith, a supporting member which is adapted to support a surface modifying agent, e.g. buffing material and buffing compound, the support member being characterized by a recess dimensioned to surround a peripheral portion of the eccentric, and bearing means coacting between the recess and the eccentric to enable the eccentric to rotate freely relative to the support member.

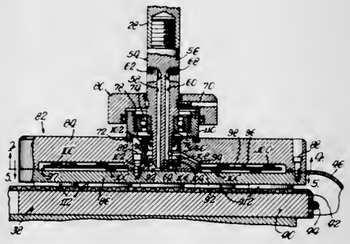


3,579,916
POLISHING MACHINE
Stephen A. Boettcher, Deerfield (Riverwoods), and Louis F. Simonetti, Morton Grove, both of, Ill., assignors to Speedfam Corporation, Des Plaines, Ill.
Filed Nov. 15, 1968, Ser. No. 776,024
Int. Cl. B24b *7/04*
U.S. Cl. 51—131 **6 Claims**



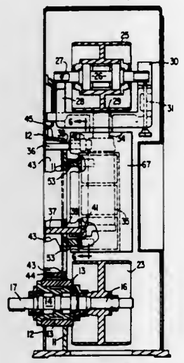
A polishing machine spindle assembly and associated load plate unit having passageway means opening at the lower surface of the unit and adapted to be placed under vacuum for maintaining a workpiece in engagement with the lower surface of the unit.

3,579,917
POLISHING MACHINE
Stephen A. Boettcher, Deerfield (Riverwoods), and Louis F. Simonetti, Morton Grove, Ill., assignors to Speedfam Corporation, Des Plaines, Ill.
Filed Nov. 15, 1968, Ser. No. 776,023
Int. Cl. B24b *7/04*
U.S. Cl. 51—131 **7 Claims**



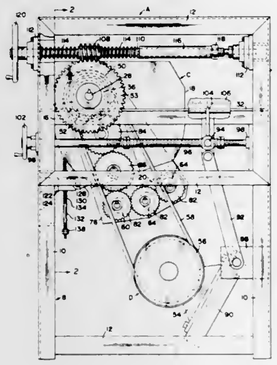
A polishing machine load plate unit to which workpieces are affixed for polishing, and through which a liquid is selectively circulated.

3,579,918
PLATEN-TYPE BELT GRINDER
Robert L. Schaller, Camillus, N.Y., assignor to Sundstrand-Engelberg Inc., Syracuse, N.Y.
Filed July 23, 1969, Ser. No. 844,149
Int. Cl. B24b *21/00, 23/06, 25/00*
U.S. Cl. 51—148 **5 Claims**



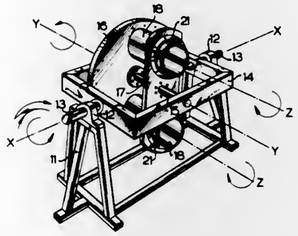
The frame of the grinder includes inner and outer spaced apart sidewalls. The abrasive belt idler roll is carried by a cylinder and piston structure which is fixed to one of the sidewalls. The platen-supporting member is fixed to the other sidewall, whereby stresses developed in the cylinder are not transmitted to the platen.

3,579,919
VIBRATING MACHINE
Charles E. Jones, Gates Mills, Ohio, assignor to Sabin Machine Co., Cleveland, Ohio
Filed May 16, 1969, Ser. No. 825,227
Int. Cl. B24b *31/06*
U.S. Cl. 51—163 **10 Claims**



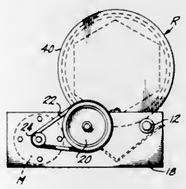
A machine for finishing parts by vibrating the parts in the presence of an abrasive media. The machine comprises a rounded bottom tube which is pivotably suspended in a frame around the tub, the suspension being by means of axially aligned shafts which project from end walls of the tub. These shafts are offset to one side of the tub center of gravity. Along the bottom of the tub on the opposite side of the center of gravity are three eccentric weights rotated on axes which are parallel with each other and with the tub pivot axis. The weights are so phased as to produce centrifugal forces which effectively vibrate the tub, and at the same time minimize the vibration transmitted to the frame around the tub.

3,579,920
POLISHING MACHINE FOR WORKPIECES
Ernst Heiberger, Reichenbach Rechberg, Germany, assignor to Jualdipex S.A., Zurich, Switzerland
Filed Dec. 23, 1968, Ser. No. 785,987
Claims priority, application Germany, Dec. 22, 1967, P1652065.3
Int. Cl. B24b *31/02*
U.S. Cl. 51—164 **20 Claims**



A polishing machine is provided which has an oscillatable frame supporting at least one hollow drum adapted for receiving the workpieces to be treated, each drum being rotatably supported from a pair of discs which in turn are supported from the frame for rotation about an axis which is perpendicular to the axis of rotation of the frame and is in the same plane therewith. The drum undergoes movement influenced by three independent rotations which are respectively controllable.

3,579,921
ROCK-POLISHING RUMBLE
Donald J. Bobo, 8511 Roosevelt Way N.E., Seattle, Wash.
Filed Apr. 3, 1969, Ser. No. 813,060
Int. Cl. B24b *31/02*
U.S. Cl. 51—164 **10 Claims**

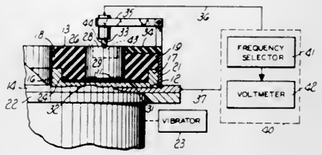


A molded tubular drum of elastomeric material having a generally cylindrical external shape and a polygonal internal shape. Identical and closures for the drum, each also of molded elastomeric material and each having a radial end wall, an axially inwardly extending center plug shaped to snugly fit within the inner cavity of the drum, and a peripheral drive rim. A girth rib and girth groove seal is provided between each drive rim and the drum. The drive rim has a reduced diameter portion axially inwardly of the seal which receives a squeeze band acting to force the drive rim radially inwardly and the sealing surfaces of the groove and rib together.

3,579,922
APPARATUS FOR ABRADING ARTICLES
Nicholas J. Mandonas, Medford, and Paul A. Ryll, Haverhill, Mass., assignors to Western Electric Company, Incorporated, New York, N.Y.
Filed Oct. 11, 1968, Ser. No. 766,735
Int. Cl. B24b *49/04*
U.S. Cl. 51—165 **7 Claims**

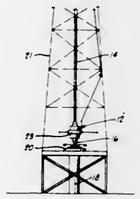
Apparatus for fine lapping of thin piezoelectric crystals to a desired resonant frequency characteristic includes a number of holders urging and lapping the crystals against a vibrating, relatively movable lapping plate bearing very fine

abrasive particles. Probes are successively pivoted into engagement with selected holders, one at a time, during lapping to sample the instant resonant frequency of each of the vibrating crystals by coupling the crystals successively into a



test circuit. While lapping of the other crystals continues, a crystal which has attained the desired frequency characteristic may be withdrawn with its holder and replaced by another holder and crystal.

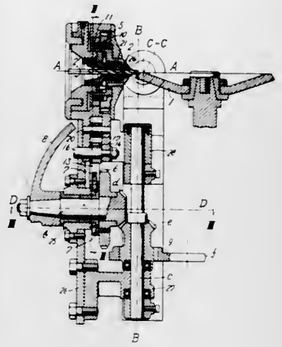
3,579,923
DRESSING TOOL METHOD AND MEANS
Prentiss Whited, 603 N. Jackson, Pratt, Kans.
Filed Aug. 4, 1969, Ser. No. 847,024
Int. Cl. B24d *5/00, 7/00;* **B24b** *19/00*
U.S. Cl. 51—209R **7 Claims**



This invention relates to a method and means of dressing abutting shoulders of oil well drill pipe stems on location. More particularly, this invention is a dressing tool means having spring-biased abrasive plates engageable with the shoulders of mating pipe stems. The method of dressing pipe joints involves the steps of utilizing the working tongs and the drill rotary table for the required power to efficiently and effectively dress abutting shoulders of drill pipe stems on location.

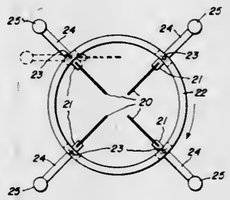
3,579,924
METHOD FOR CONTINUOUSLY GRINDING A DRILL TIP END INTO A NORMAL SHAPE AND INTO A SPLIT POINT
Mataichi Saito, No. 13-3 6-chome Chuo, Ota-ku, Tokyo-to, Japan
Filed Apr. 16, 1968, Ser. No. 721,683
Claims priority, application Japan, May 10, 1967, 42/29150
Int. Cl. B24b *19/64, 3/24*
U.S. Cl. 51—288 **1 Claim**

The specification discloses a novel method for continuously grinding a drill tip end into a normal shape and into a split point form, without removing and replacing the drill between the normal shape grinding procedure and the split point grinding procedure. A drill to be ground is first ground at its tip end portion into a normal shape, and subsequently but continuously to the preceding procedure the drill tip end is ground into a split point, whereby the drill can be ground in two ways in a single step of process. This means a great ad-



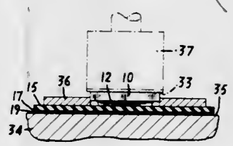
vantage over the prior art in speed of the processing and quality of the resultant product.

3,579,925
ABRASIVE WHEEL
William P. Densmore, Worcester, Mass., assignor to Norton Company, Troy, N.Y.
Filed Dec. 2, 1968, Ser. No. 780,404
Int. Cl. B24d *9/00*
U.S. Cl. 51—330 **1 Claim**



A rotary abrasive device having a plurality of independent depending leaves mounted internally of a rotary hub structure for abrading or polishing purposes.

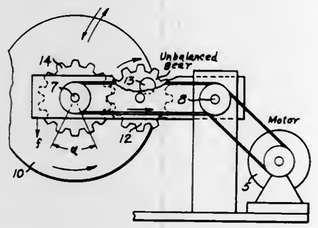
3,579,926
SANDBLASTING STENCIL AND METHOD OF MAKING SAME
Anthony Mario Gaspari, Montreal, Quebec, Canada, assignor to Pall (Canada) Ltd., Montreal, Quebec, Canada
Filed Aug. 2, 1968, Ser. No. 749,722
Int. Cl. B24b *55/00*
U.S. Cl. 51—262 **9 Claims**



This invention provides a method for precutting sandblasting stencil by cutting with a die a two-ply stencil comprising a soft, elastomeric masking sheet of material resistant to erosion by sandblasting, having on one face a layer of adhesive which is removably bonded to a harder, flexible nonelastomeric plastic backing sheet, so as to cut out the

stencil pattern through the masking sheet without cutting through the backing sheet. The second face of the masking sheet is then covered with an adherent sandblast-erodable retaining sheet to form a three-ply die-cut stencil sheet. For use in sandblasting, the backing sheet is stripped off, exposing the adhesive layer on the masking sheet, which is thereby bonded to a stone surface after the cutout portions are removed. This invention also provides the three-ply die-cut stencil sheet comprising sandblasting-erosion-resistant masking sheet, an adhesive layer bonded to a backing sheet on one surface of the masking sheet and an adherent retaining sheet bonded to the second face of the masking sheet.

3,579,927
VIBRATORY GRINDING METHOD
Loring Coes, Jr., Princeton, Mass., assignor to Norton Company, Worcester, Mass.
Division of Ser. No. 597,598, Nov. 29, 1966, Pat. No. 3,451,171.
Int. Cl. B24b *1/00*
U.S. Cl. 51—281 **4 Claims**



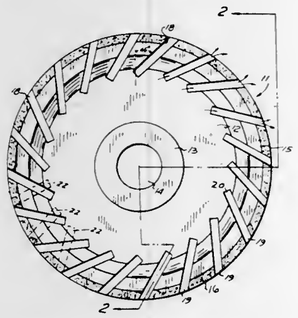
This invention relates generally to improvements in methods and machines for grinding wheels, and particularly to methods and machines for providing intermittent pressure contact between a grinding wheel and a workpiece.

In a particular embodiment of the invention, intermittent or vibratory pressure is applied to successive positions on the cutting surface of a grinding wheel in grinding contact with a workpiece by mounting a drive member or a gear having a given number of teeth on the wheel spindle for driving or meshing with a driven member or gear with an unbalanced weight distribution and having a different number of teeth from the number on the driver gear.

ERRATUM

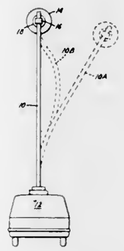
For Class 51—315 see:
Patent No. 3,579,933

3,579,928
SELF-AIR COOLING ABRADING WHEEL
Gerhard R. Held, 22644 Shiell Drive, Mount Clemens, Mich.
Filed July 14, 1969, Ser. No. 841,439
Int. Cl. B24b *55/02*
U.S. Cl. 51—356 **4 Claims**



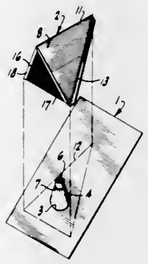
A self-air cooling abrading wheel having a flat annular web and an axially enlarged annular rim with a peripheral abrading surface thereon, and with a first series of elongated angularly related slots formed in said rim around its periphery extending inwardly of the rim for a portion of its width, said slots having air inlets adjacent said web and outlets extending radially outward of said rim, and a second series of said angularly related slots extending inwardly from the other side of said web, the slots of the second series being alternated with the slots of the first series and independent thereof.

3,579,929
FLEXIBLE STRUCTURE ORIENTATION CONTROL
Philip D. Holthenrichs, Malvern, and Robert P. Wanger, Valley Forge, Pa., assignors to General Electric Company
Filed Jan. 29, 1969, Ser. No. 794,874
Int. Cl. F16f *7/00, 15/30;* **F04h** *12/00*
U.S. Cl. 52—1 **3 Claims**



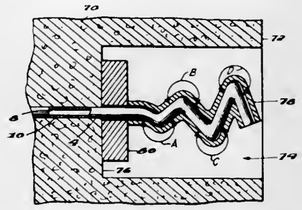
Separated parts of a flexible structure are maintained in a predetermined desired orientation with respect to each other against the action of distorting forces by applying to selected part or parts of the structure inertially developed torques (e.g. from flywheels) to main the selected part in its desired orientation with respect to a selected reference part of the structure.

3,579,930
SNOW DEFLECTOR UNIT
Herman G. Murphy, P. O. Box 446, Incline Village, Nev.
Filed July 17, 1969, Ser. No. 842,616
Int. Cl. E04d *13/10*
U.S. Cl. 52—24 **10 Claims**



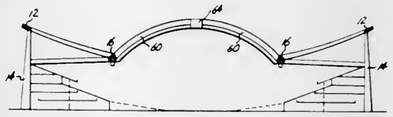
A sheet metal snow deflector unit comprising an apertured baseplate having a tapered column extending upwardly therefrom into a generally pyramidal shaped deflector secured to the baseplate. The deflector comprises a pair of substantially triangular sidewalls connected along a line which extends at a predetermined angle of inclination relative to the baseplate to define a cleavage edge for a mass of snow moving down an inclined roof to which the deflector unit is secured to protect a vent pipe projecting through the roof into the deflector. The front wall of the deflector comprises a wire mesh screen to permit exhaust to emanate from the vent pipe.

3,579,931
METHOD FOR POST-TENSIONING TENDONS
Frederic A. Lang, Landenberg, Pa., assignor to E. I. du Pont De Nemours and Company, Wilmington, Del.
Division of Ser. No. 712,796, Mar. 13, 1968, Pat. No. 3,513,609, Continuation-in-part of application Ser. No. 623,709, Mar. 16, 1967, now abandoned.
Int. Cl. E04c *3/29, 5/01;* **E04g** *21/12*
U.S. Cl. 52—741 **5 Claims**



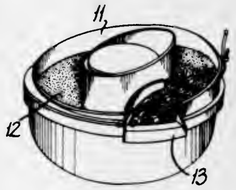
An anchoring system is provided wherein the end of a post-tensioned tendon extending from a concrete structure is encased in a metallic sheath and the sheath is crimped in a series of reversals of increasing angularity in the direction away from the concrete structure.

3,579,932
CABLE-SUSPENDED ROOF STRUCTURE
Ross T. Atkinson, Federal Way, Wash. (2nd & University Bldg., Suite 406, Seattle, Wash. 98101)
Filed Apr. 28, 1969, Ser. No. 819,821
Int. Cl. E04b *7/14*
U.S. Cl. 52—83 **8 Claims**



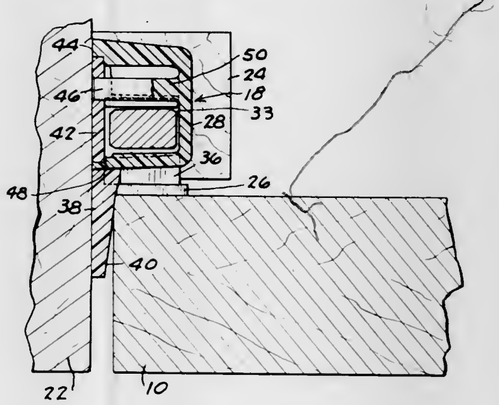
A cable-suspended roof structure is provided to span wide areas as, for example, stadiums, coliseums, arenas, playing fields and the like. More specifically, a roof is provided in which cables under tension extend between substantially centrally located tension ring means and a surrounding continuous or enclosed ringlike compression member, their ends being anchored securely therein and said cables being under tension. An upper and a lower double layer of cables is employed and compression spreader means spanned between each cable of either set and each of the proximate cables of the other set.

3,579,933
METHOD OF MANUFACTURING A CAM FOR USE IN AN IGNITION DISTRIBUTOR
John Snell, Welford-On-Avon, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Jan. 7, 1969, Ser. No. 789,504
Claims priority, application Great Britain, Jan. 8, 1968, 981/68
Int. Cl. B24b *1/00*
U.S. Cl. 51—315 **1 Claim**



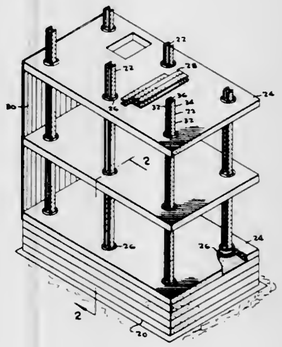
A cam for use in a distributor in a road vehicle is made by grinding the cam to the desired profile in the usual way, this operation leaving the cam surface with sharp edged asperities defining therebetween channels which in use store lubricant. The cam is then placed in a container with abrasive particles and the container is so moved that the particles collide with the cam surface and round off the sharp edges of the asperities without removing the asperities.

3,579,934
MAGNETIC DOOR CATCH WITH RISER
Raymond L. Pietsch, Flint, Mich., assignor to The Engineered Products Company, Flint, Mich.
Filed Sept. 17, 1969, Ser. No. 858,650
Int. Cl. E05c *19/16*
U.S. Cl. 49—394 **9 Claims**



A combined door catch and riser unit having a magnet and two exposed pole faces carried by a body having opposed flanges providing a mounting surface. A ramp with an inclined surface projects generally perpendicular to the pole faces and is carried by the body adjacent its mounting surface to raise a door when it engages the catch.

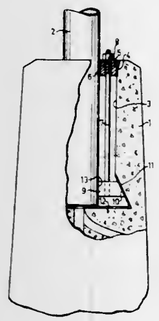
3,579,935
SYSTEM FOR ERECTING MULTISTOREY BUILDINGS
James L. Regan (409 Dunkel St., Fairbanks, Alaska, 99701), and David L. Garnhart, Hayward, Calif.
Filed June 14, 1968, Ser. No. 737,022
Int. Cl. E04b *1/35*
U.S. Cl. 52—126 **25 Claims**



A slab lifting jack assembly system associated with a vertical H-beam having a row of aligned vertical openings on each side of each flange of the beam with the jack assembly having an upper set of pins movable by hydraulic cylinder means into and out of engagement with the openings in the flanges

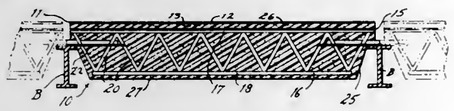
and a lower set of pins similarly movable with a main hydraulic cylinder connected between an upper frame supporting the upper pins and a lower frame supporting the lower pins with the upper frame also being connected to a concrete slab so that extension of the hydraulic cylinder serves to lift the slab when the upper pins are retracted out of engagement with the flange openings and the lower pins are extended to remain in the flange openings so that the slab is consequently lifted by extension of the frame cylinder and with control means including logic circuitry for detecting and preventing malfunctions of the system.

3,579,936
POLE BASE PROVIDING ADJUSTABILITY FOR ANGULAR AXIAL ALIGNMENT OF THE POLE
Gustav Mattias Andersson, Barnhemsgatan 10, 731 00 Koping, and Ernst Henning Ture Granstrom, Koping, Sweden
Filed May 23, 1969, Ser. No. 827,416
Claims priority, application Sweden, May 29, 1968, 7188/68
Int. Cl. E02d *27/42*; **F16b** *2/14*
U.S. Cl. 52—297 **4 Claims**



An arrangement for providing an angular adjustment of the vertical axis of a post relative to a foundation block in which the post is mounted includes an annular guiding retaining means, having a convex surface for making a line contact with the post, carried in an upper end of the foundation block together with a plurality of jaw means for effecting lateral adjustment of the lower end of the post within the foundation block.

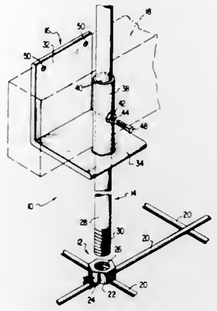
3,579,937
FOAM PLASTIC PANEL WITHOUT TRUSS MEMBERS
Edward E. Lukens, 1427 Lane Ave., Bethlehem, Pa.
Filed May 29, 1969, Ser. No. 828,996
Int. Cl. E04c *2/22*; **E04b** *1/24*
U.S. Cl. 52—309 **5 Claims**



A lightweight insulating panel is provided of large area suitable for building use which consists of a hard top and immediately there-below a lath or wire mesh with truss members fastened to the lath and rigid plastic foam surrounding the lath and the truss members.

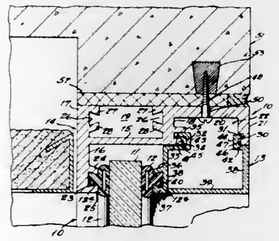
3,579,938
SCREED HOLDING DEVICE
Iner O. Hanson, P.O. Box 918, Whitefish, Mont.
Filed May 8, 1969, Ser. No. 823,119
Int. Cl. E04f *13/04*
U.S. Cl. 52—365 **4 Claims**

A device for supporting a screed at the proper elevation in a concrete form. The device has a convenient base which is attached to the lower surface of the form, and an upright support that is releasably engaged in the base. The upright



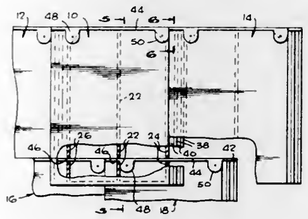
member has a bracket adjustably and releasably supported therealong to receive the screed member therein.

3,579,939
FRAME STRUCTURE FOR GLASS OR SOLID PANEL WALLS
Ellis V. Eichman, Irving, Tex. (790 Fruitdale Road, Brownsville, Tex. 78520)
Filed Oct. 17, 1969, Ser. No. 867,230
Int. Cl. E04b *2/88*
U.S. Cl. 52—397 **8 Claims**



A frame structure for glass or solid wall panels providing for the arrangement of the glass or other type panels in a common plane an in such manner as to prevent lateral movement thereof due to vibrations caused by traffic movement, wind pressures, and other factors, minimizing the framing profile and the number of parts comprising the structure by providing a single frame element and panel retention means of unique design for fabricating all parts of a frame structure.

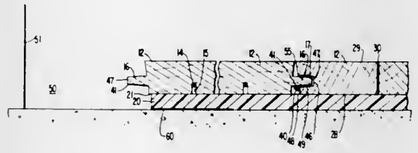
3,579,940
ROOFING TILE
James O. Greenleaf, Los Angeles, Calif., assignor to Stepan Chemical Company
Filed June 13, 1969, Ser. No. 833,107
Int. Cl. E04d *1/20, 3/32*
U.S. Cl. 52—542 **6 Claims**



Plastic molded roofing tile arranged so that laterally positioned tiles overlap in a ridge and channel arrangement. An

upstanding flange at the top end of this overlap dams water flow against movement in that direction. Longitudinally related tiles are also overlapped with an upstanding flange at the upper end of the lower tile engaging in a transverse groove through reinforcing ribs in the bottom of the upper tile. Upstanding nailing bosses in the lower tile engage between the flanges to provide a locator stop to locate and rigidize the interrelationship. In one embodiment, the upstanding flange lockingly engages the downwardly directed ribs to prevent direct upward lifting of the upper tile.

3,579,941
WOOD PARQUET BLOCK FLOORING UNIT
Howard C. Tibbals, P.O. Drawer A, Oneida, Tenn.
Filed Nov. 19, 1968, Ser. No. 777,070
Int. Cl. E04b *5/00*; **E04f** *15/04, 15/16*
U.S. Cl. 52—384 **6 Claims**

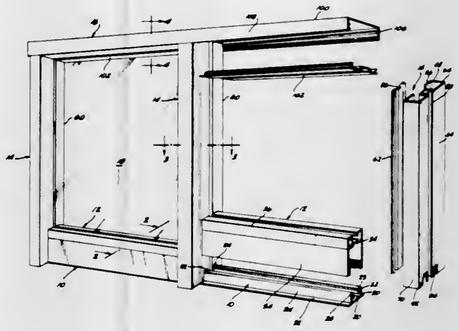


Wooden parquet block flooring incorporating cellular foam in multiple parquet block units having rubberlike flexible adhesive joining tongue and groove formations within the multiple block unit.

3,579,942
FASTENER ANCHORED IN HONEYCOMB PANEL
John M. Cole, New Hope, Pa., assignor to Thomas & Betts Corporation, Elizabeth, N.J.
Filed Dec. 5, 1969, Ser. No. 882,568
Int. Cl. E04b *2/28*; **F16b** *13/08*
U.S. Cl. 52—615 **10 Claims**

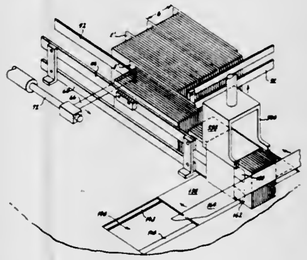
A honeycomb fastener retainer includes the combination of a fastener receiving body member designed to be inserted through an opening in one surface of the panel and into a hollowed out cavity area of the panel core where it is retained in place by means of body attached, elongated, flexible finger elements which collapse in a limited manner to permit the body member to pass through the outer panel opening which spread out to a normal position beneath the panel surface in the area of the outer panel opening to permit removal of the body member from the panel. A cap member covers the panel opening, and interlocks with the finger element of the body member and engages the panel surface by suitable means to prevent rotation of the fastener retainer assembly upon its receiving a threaded fastener.

3,579,943
PANEL FRAME ASSEMBLY
Wayne C. Tam, Monterey Park, Calif. (752 La Portada, South Pasadena, Calif. 91030)
Filed May 28, 1969, Ser. No. 828,654
Int. Cl. E04c *2/38*
U.S. Cl. 52—656 **7 Claims**



In a disclosed panel frame system at least one sill assembly is supported by an elongated base member, with a pair of vertically extending mullion or jamb assemblies disposed on the base member at opposite ends of the sill assembly, and with an elongated head channel assembly secured to the ceiling in alignment with the base member. The sill, mullion, and head channel assemblies each include a removable plate which may be snapped into rigid mating relationship with the sill, mullion, or head channel members. The inwardly facing surfaces of the sill, mullion and head channel plates may be provided with a panel receiving recess. The lower extremity of a mullion member broad wall defines a pair of notches which snugly receive flanged sidewalls of the base member. A single base rail embodiment and a ledge sill embodiment of the frame system are also disclosed.

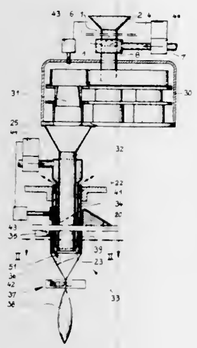
3,579,944
APPARATUS AND METHOD FOR BANDING GROUPS OF ENVELOPES
Vincent E. Heywood, Worcester; Donald H. Bushey, Shrewsbury, and William A. Chapman, Jr., Hubbardston, Mass., assignors to United States Envelope Company, Springfield, Mass.
Division of Ser. No. 502,759, Oct. 18, 1965, Patn. No. 3,399,788, Continuation-in-part of application Ser. No. 326,024, Nov. 26, 1963, now abandoned.
Int. Cl. B65b *27/08, 57/14*; **B65h** *33/08*
U.S. Cl. 53—3 **7 Claims**



In an apparatus and method for banding envelopes, envelopes first advance in succession from an envelope making machine toward a banding station by moving perpendicular to their faces while supported on their edges in face to back relation. Immediately prior to reaching the banding station the forwardmost group is segregated from the advancing succession by a laterally movable pusher which shifts the group endwise to the banding station where it is temporarily sup-

ported between spaced side fingers. At the banding station is an opening in the floor plate which extends across the width of the envelope group and which is straddled by the length of the group. A sliding plate covers the opening during the movement of the envelope group to the banding station. After the envelope group is properly positioned at the banding station the sliding plate is withdrawn and a band placed across the top of the group is pressed by two vertically moving blades down both sides of the group. The band is of such a length and so positioned that the portion thereof extending along one side of the envelope group terminates at approximately the bottom edge of the group and so that the portion thereof extending along the other side of the group extends below the bottom edge of the group and through the floor plate opening. The sliding plate is thereafter returned to closing relation with the opening and as it is so moved its forward edge carries the protruding portion of the band along the bottom of the group. Other means thereafter fold the remaining free end portion of the band upwardly into sealing engagement with the opposite end portion and the group is then pushed from the banding station by the next following group.

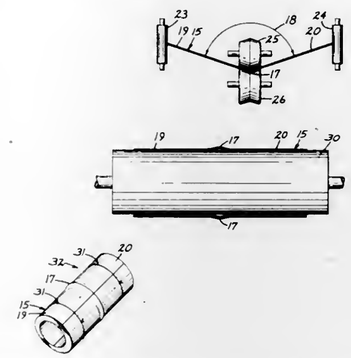
3,579,945
APPARATUS FOR REDUCING THE ATMOSPHERIC OXYGEN CONTENT OF FLUENT SOLID POURABLE MATERIALS BY GAS EXCHANGE
Norbert Buchner, Beutelsbach, Wurttemberg, and Klaus Domke, Stuttgart-Weilimdorf, Germany, assignors to Fr. Hesser Maschienfabrik Aktiengesellschaft, Stuttgart-Bad Cannstatt, Germany
Filed Aug. 8, 1969, Ser. No. 848,479
Claims priority, application Germany, Aug. 22, 1968, P 17 86 137.9
Int. Cl. B65b *31/04*
U.S. Cl. 53—112 **11 Claims**



To prevent spoiling of fluent solid materials by the action of atmospheric oxygen entrapped in the material during the packaging thereof in a form, fill and seal machine, the materials are subjected to a counterflow treatment with a gas which will take up the oxygen. For this purpose there is a gas supply conduit opening into the zone of the materials in the feed pipe of the machine, and a gas-storage chamber in the forming mandrel of the machine above this zone.

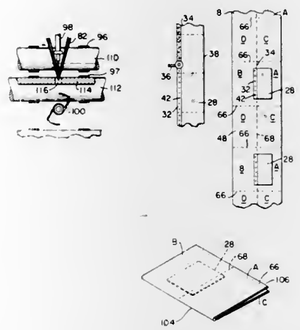
3,579,946
METHOD OF PRODUCING A ROLLED BUNDLE OF PREFORMED VALLEY FLASHING
Robert S. Graving, Rte.4 Box 432, Osseo, Minn.
Filed Oct. 1, 1969, Ser. No. 862,898
Int. Cl. B65b *63/04, 61/02, 13/02*
U.S. Cl. 53—21FW **5 Claims**

A method of producing seamless rolled valley flashing by creasing an elongated relatively narrow length of flexible sheet material along its length to provide a cross-sectionally relatively shallow V-shaped form having an obtuse included angle. The creased sheet material is positioned on a cylindrical arbor with the obtuse included angle disposed to face radially toward the arbor and by increasing the included



angle rolled onto the cylindrical arbor and secured to provide a rolled bundle of preformed valley flashing.

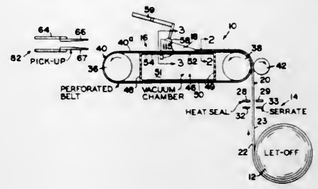
3,579,947
METHOD OF PRINTING AND FOLDING A MAILING PIECE
Mario Kalman, Philadelphia, Pa., assignor to Goodway Inc., Philadelphia, Pa.
Filed Apr. 7, 1969, Ser. No. 813,892
Int. Cl. B65b *63/04;* **B31b** *1/16, 1/72*
U.S. Cl. 53—23 **5 Claims**



The method of printing and folding a mailing piece including the steps of running a continuous paper web, printing desired information on the web, selectively feeding insertion envelopes with previously glued tabs onto said web at one side thereof in spaced relationship, adding an axially aligned strip of glue to the other side of the said web, transversely perforating the said web intermediate the said affixed envelopes, transversely cutting the said web immediately adjacent the said perforation, rotating the said cut web portions to a folder utilizing the said perforations, transporting the said cut and folded web sections to a final folder and trimming the edges to thereby provide a finished mailing piece having a glued tab envelope inserted therein.

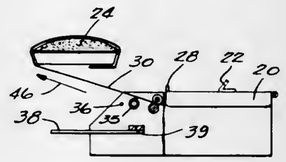
3,579,948
BAG HANDLING APPARATUS AND METHOD
Bernard Lerner, Hudson, Ohio, assignor to Automated Packaging Corporation, Bedford Heights, Ohio
Filed Apr. 29, 1968, Ser. No. 731,672
Int. Cl. B65b *43/04, 43/30, 43/36*
U.S. Cl. 53—29 **13 Claims**

A chain of bags in part carried by a gas-permeable movable belt is held in place against the belt by a vacuum while the belt is advanced and a flow of gas expands a bag for load-



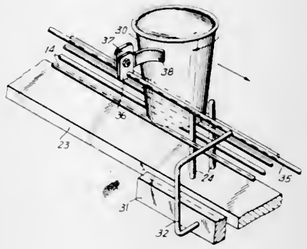
ing. Marginal edges of the bag chain may be isolated from the vacuum to facilitate bag expansion.

3,579,949
WRAPPING METHOD AND APPARATUS
Charles E. Michels, Racine, Wis., assignor to Wrapping Machinery Company, Inc., Franksville, Wis.
Filed Aug. 23, 1967, Ser. No. 662,674
Int. Cl. B65b *67/08*
U.S. Cl. 53—33 **17 Claims**



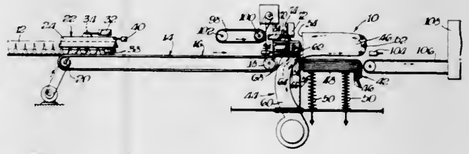
Disclosed herein is a wrapping method and apparatus in which an article is positioned on a table at one side of a film web withdrawal port. At the other side of the port there is a hot-wire web-severing tool and a package rest or support in the form of a narrow, open-ended, outwardly projecting arm. A length of film web is drawn through the port upwardly and forwardly about the article to partially wrap it. The partially wrapped article is then drawn toward the operator to sweep it past the hot wire to cut the web. The article is deposited on the arm, and laterally extending film wings are folded downwardly and around the arm to the undersurface thereof. The article is then transferred to a sealing surface against which the underfolded wings are sealed.

3,579,950
METHOD OF AND APPARATUS FOR OBVIATING SPILLAGE IN MOVING CONTAINERS
Glenn V. Davis, Watertown, N.Y., assignor to Borden, Inc., New York, N.Y.
Filed Jan. 3, 1969, Ser. No. 788,753
Int. Cl. B65b *3/04, 7/28*
U.S. Cl. 53—37 **4 Claims**



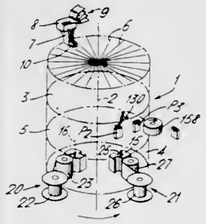
The present invention relates to a high-speed conveyor-type canning machine comprising means for supplying containers, means for affixing closures on a filled container, comestible depositing means interposed between said supplying means and said affixing means, means for continuously advancing said containers to said depositing means and said affixing means, and means for intercepting and rotating said container prior to positioning same beneath said closure affixing means whereby a vortex is induced in said comestible to prevent overflow.

3,579,951
ARRANGEMENT FOR BAGGING ARTICLES
Louie R. Lowery, Cedar Knools, N.J., assignor to Keyes Fibre Company, Waterville, Maine
Filed June 16, 1969, Ser. No. 833,410
Int. Cl. B65b *57/02, 43/36*
U.S. Cl. 53—55 **11 Claims**



Arrangement for bagging articles comprises frame with conveyor on frame for propelling articles along longitudinal path of travel. Supply of flexible bags is adjacent longitudinal path of article travel, and each bag of supply has closed and open ends with portion adjacent open end thereof secured to bag retainer on frame. Bags are singly inflated open into article-receiving position in longitudinal path of article travel so that closed end of each inflated bag is downstream of opened end thereof. Conveyor propels each article into inflated opened bag so that momentum of propelled article tears associated bag away from bag retainer which enables next bag of supply to be inflated into article-receiving position for next article on conveyor.

3,579,952
PACKING MACHINES
Robert William Davies; Charles Thomas Hall; Dennis Hinchcliffe; Alan Keith McCombie, London, England, and Derek Henry Youngman, Maitland, Cape Province, South Africa, assignors to Molins Machines Company Limited, London, England
Filed Oct. 24, 1966, Ser. No. 590,153
Claims priority, application Great Britain, Nov. 1, 1965, 46143/65
Int. Cl. B65b *19/04, 19/12, 43/10*
U.S. Cl. 53—37 **63 Claims**

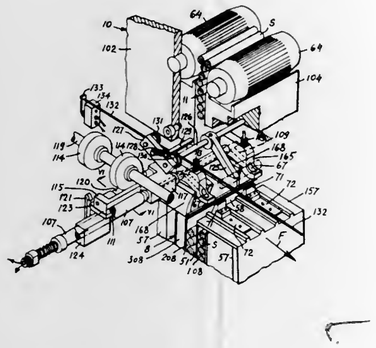


A rotary cigarette packing machine having three layers, namely: a top layer in the form of a hopper which receives a continuous stream of cigarettes and divides them up into bundles; a bottom layer which forms open-ended packets from webs of packet material; and a middle layer which pushes the bundles into the packets, closes them and delivers them in one continuous stream. The machine rotates continuously about a vertical axis past a continuous supply of cigarettes and a continuous supply of each of the packet materials and comprises a number of sets of mechanisms, considered vertically, each of which will perform the complete packing operation so that that operation is being performed a number of times simultaneously.

3,579,953
CIGARETTE PACKERS

Goffredo Gianese, Bologna, Italy, assignor to AMF Incorporated

Continuation-in-part of application Ser. No. 734,371, June 4, 1968, now Patent No. 3,531,911, and a continuation-in-part of 734,372, June 4, 1968, now Patent No. 3,553,925. Filed May 27, 1969, Ser. No. 828,197
Int. Cl. B65b *19/04*
U.S. Cl. 53—59 10 Claims

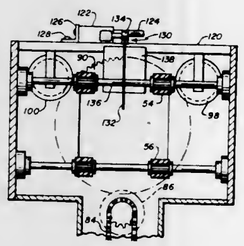


A packaging machine comprising an endless conveyor having a plurality of successive containers for receiving rodlike articles, such as cigarettes, including means for feeding a predetermined number of rodlike articles to the container from the feeder as the conveyor moves. Particularly, the feeding means comprise a vertical channel in which a plurality of superimposed cigarettes are maintained, said channel being provided with an oscillating support at its bottom which is actuated in synchronism with the passage of the containers to lower and permit the cigarettes to fall into the container.

3,579,954
CARTON-SEALING APPARATUS WITH ROTATION CONTROL

Tex Bates, Union City, Calif., assignor to The Finn Industries, Inc., Chicago, Ill.

Filed Aug. 21, 1969, Ser. No. 851,844
Int. Cl. B65b *57/00, 7/20*
U.S. Cl. 53—76 7 Claims

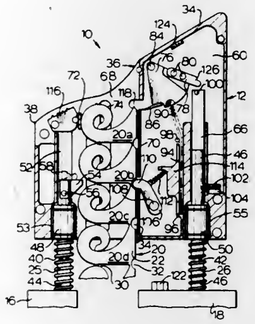


An improved means in a carton-sealing apparatus for actuating rotation of a turn box which turns a vertically received carton to a horizontal position by a 90° turn. An elongated switch of the actuating mechanism is contacted by a carton only after it has turned to the horizontal position, and a stop member checks the advance of a following carton in the vertical position in the turn box to prevent jamming.

3,579,955
APPLICATOR FOR BAG CLOSURES

John Christie Gunyou, Toronto, Ontario, and Stanley Albert Charles Browning, Glen Williams, Ontario, Canada, assignors to Hybrid Turkeys Limited, Brampton, Ontario, Canada

Filed Feb. 27, 1969, Ser. No. 802,961
Int. Cl. B65b *7/06*
U.S. Cl. 53—138 8 Claims

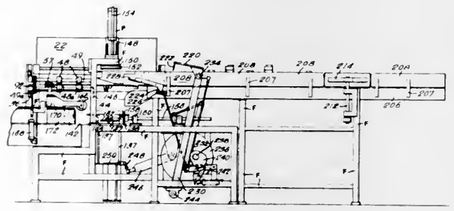


Bag closures in strip form so that adjacent bag closures are joined by two links therebetween, are fed through an applicator seriatim, and are applied one at a time around a gathered neck of the bag as it is drawn across the upper face of the applicator. The applicator has a restricting motion relative to its support; means are provided to restrict movements of the strip of bag closures as the body of the applicator moves downwards; other means are provided to cut one of the links between the leading and next adjacent bag closure in the strip in the applicator as near its lower limit of motion; and other means are provided to secure the bag closures within the applicator as it moves upwards, thereby advancing the strip of bag closures through the applicator seriatim.

3,579,956
PACKAGING APPARATUS

Wolfgang Hoffmann, Beaconsfield, Quebec, and Paul Wick, Valois, Quebec, Canada, assignors to Canadian International Paper Company, Montreal, Quebec, Canada

Filed June 3, 1968, Ser. No. 734,029
Int. Cl. B65b *35/50*
U.S. Cl. 53—159 10 Claims

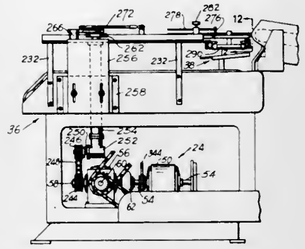


A wrapping apparatus whereby a commodity is wrapped from the bottom upwardly, the wrapping apparatus having wrapping-feeding means preferably with glue-applying means for placing glue on selected portions of the wrapper as the wrapper is fed. The commodity-feeding component for placing the commodities on the wrapper is either a one or two level device for placing single or double layers of commodities on the wrapper.

3,579,957
BAGGING APPARATUS

James Claiborne Mills, Jr., Chesterfield County, and Gordon W. Hays, Richmond, Va., assignors to AMF Incorporated

Filed Feb. 19, 1968, Ser. No. 706,435
Claims priority, application Great Britain, May 3, 1967, June 7, 1967, 10201/67;26296/67
Int. Cl. B65b *5/04*
U.S. Cl. 53—190 10 Claims

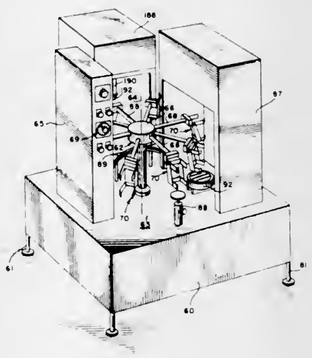


A bagging apparatus comprising a frame, an electric drive motor mounted thereon and a power train for transmitting the power of the motor to the driven members hereinafter described. These include a flighted infeed conveyor, a bagging mechanism operable to receive articles from the infeed conveyor, pickup a bag from a supply thereof, and in conjunction with a blockade member to effect relative movement between the article supported therein and the bag to pull the bag over the article and strip the bagged article from the mechanism, a drop transfer mechanism for temporarily supporting an article at the transfer area between the forward end of the infeed conveyor and the bagging mechanism, and an elevator mechanism for receiving bagged articles stripped from the scoop-tray mechanism and transporting them to an outfeed conveyor.

3,579,958
MACHINE FOR FORMING, FILLING, AND SEALING CONTAINERS

Ronald L. Hentges, Minneapolis, and Howard R. Garrett, St. Paul, Minn., assignors to Haskon Incorporated, Warsaw, Ind.

Filed Aug. 15, 1969, Ser. No. 850,417
Int. Cl. B65b *7/18, 43/28*
U.S. Cl. 53—183 17 Claims

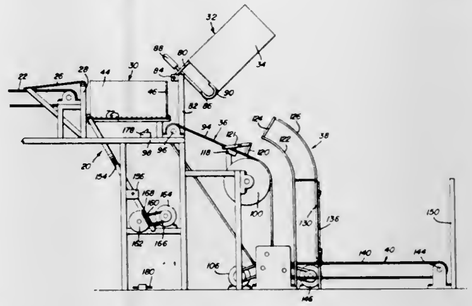


A machine for automatically forming, filling, and sealing tubular container blanks that continuously holds the container blanks in an open and upright position from their external vertical sides and feeds them in sequence to the machine's forming, filling, and sealing operations.

3,579,959
AUTOMATIC GROCERY BAG FILLING APPARATUS WITH INNER AND OUTER TRAY

Gaspar Robert Bossetta, Rte. 1, Box 297, Lacombe, La.

Continuation-in-part of application Ser. No. 664,195, Aug. 29, 1967, now abandoned. Filed Aug. 27, 1968, Ser. No. 766,661
Int. Cl. B65b *5/06, 39/00, 67/02*
U.S. Cl. 53—260 15 Claims

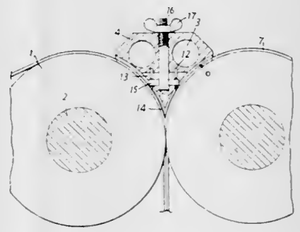


An apparatus for automatically filling grocery bags with items purchased by a customer in a supermarket or the like including a tray in which the items are placed as they are registered on the checkout cash register, a bag holder on which an opened grocery bag is placed with the bag holder being movable into a position for telescopically receiving the tray while, the items are discharged from the tray into the grocery bag together with a conveyor structure for removing the grocery bag from the grocery bag holder and storing in an accessible position. In one embodiment of the invention, the tray is supported within a drawer structure which is actuated by a mechanism to first elevate the drawer into an inclined position in aligned relation to the grocery bag bag and then inserting the tray from the drawer into the grocery bag, releasing the items into the bag and then retracting the tray and returning the tray and drawer to its normal position for placing subsequent items in the tray.

3,579,960
POWDER-ENCAPSULATION MACHINE

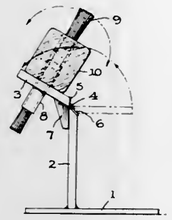
Maharaj Krishen Mehta, Lakeside, Cardiff, Wales, assignor to P. Leiner & Sons (Encapsulations) Limited, Treforest, Glamorganshire, Wales

Filed Mar. 10, 1969, Ser. No. 805,687
Claims priority, application Great Britain, June 26, 1968, 30567/68
Int. Cl. B65b *47/02*
U.S. Cl. 53—184 5 Claims



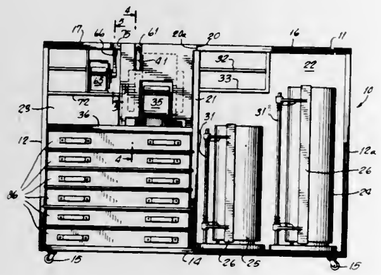
Apparatus for forming filled gelatine capsules having two pocketed die rolls and a heater block supported between the die rolls to heat the gelatine ribbons as they approach the nip of the rolls, the side faces of the heater block being spaced from the ribbons to heat them by radiation. A tip member for heating the ribbons by direct contact immediately before their passage through the nip can be freely suspended from the heater block.

3,579,961
CAKE WRAPPING DEVICE
Hans J. Dessauer, Childersburg, Ala.
Filed Apr. 10, 1969, Ser. No. 815,011
Int. Cl. B65b *67/08, 11/00*
U.S. Cl. 53—390 **5 Claims**



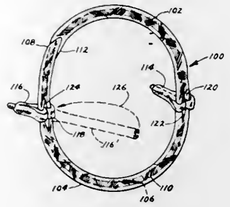
The yarn cake wrapping device comprises a tubular member passing through an arm which is pivotally mounted near one end so that it can be swung from one side of the mount to the other. A rigid tubular cake wrapper is placed in the tubular member and a cake of yarn is disposed about the tubular member and wrapper while the arm is in the load position. The upper end of the wrapper is drawn down about the cake and the arm is swung to a horizontal position on the other side of the mount to discharge the cake. The free end of the wrapper is then drawn over the second end of the cake.

3,579,962
COMBINED WRAPPING AND TAPING WORK TABLE
Frank P. Mitten, 182 W. 55th St., New York, N.Y.
Filed Sept. 10, 1969, Ser. No. 856,755
Int. Cl. B65b *67/10*
U.S. Cl. 53—390 **8 Claims**



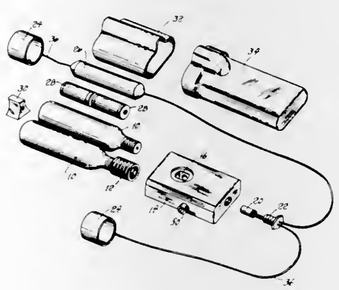
The present invention provides a combined wrapping and taping work table for shipping department use having a flat working surface which is divided into two areas, one being fixed and the other being hingedly connected for upward movement, a compartment below the fixed area having vertically disposed rolls of wrapping paper with spring-pressed tearing bars in engagement with their peripheries, and the compartment below the hinged area having two gummed tape delivery and moistening machines, and a labeling device, one of said gummed tape delivery and moistening machines having a hinged crank arm extension or handle which lies horizontally below said hinged work table surface when at rest, an enlarged opening in said work table above said hinged crank arm connecting to a forwardly directed slot, said hinged crank arm being manually engageable through said enlarged opening and movable along said slot to deliver a preselected amount of moistened tape.

3,579,963
ANIMAL HALTERS
Colonel Henry, Lawton, Iowa
Filed July 11, 1969, Ser. No. 841,052
Int. Cl. B68b *01/02*
U.S. Cl. 54—24 **3 Claims**



Animal halters constructed of a braided hollow-core line are described. One form of halter having a locking piece in the nosepiece for locking the sidepieces to the nosepiece without requiring hardware clamps is described. Other halter embodiments interwoven from segments of braided hollow-core line, are also described.

3,579,964
SQUIB-POWERED AUTOMATIC INFLATION DEVICE
Paul E. Ohlstein, Smithtown, N.Y., assignor to the United States of America as represented by the Secretary of the Navy
Filed July 1, 1969, Ser. No. 838,164
Int. Cl. B67b *7/24*
U.S. Cl. 222—5 **1 Claim**

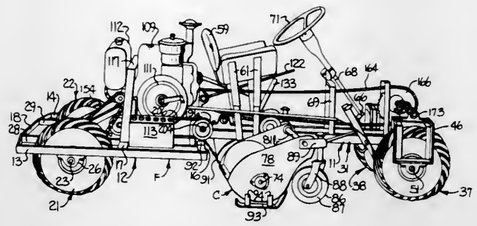


An explosive squib device for automatically inflating a life vest when the device is immersed in sea water. The explosive squib, when fired, actuates piercing pins which allow pressurized CO_2 to escape from a pair of gas cartridges into the life vest. The gas cartridges are formed from electrically conductive material, electrically insulated from each other, separated from each other physically, and made part of the electric circuit which fires the explosive squib. The cartridges thus form a pair of electrodes separated by an air gap, the circuit being closed when the cartridges are immersed in sea water.

3,579,965
MOWING MACHINE
Johnnie J. Musgrove, 1604 Amberly Road, Charleston, S.C.
Filed Dec. 31, 1968, Ser. No. 788,287
Int. Cl. A01d *75/30*
U.S. Cl. 56—7 **9 Claims**

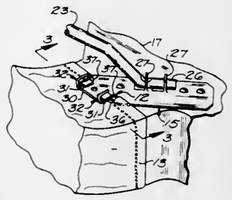
A four-wheel drive mowing machine including a frame having pairs of driven front and rear wheels provided with tires, the width of the tires being substantially greater than the width of the sidewalls. The front wheels are mounted on opposite ends of an axle mounted on the frame for pivotal movement in a substantially vertical plane about the frame

cental axis and a pair of laterally extending front cutters are supported on the frame on opposite sides of the central axis



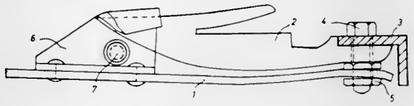
together with a rear cutter supported on the frame and arranged centrally of the central axis between the rear wheels.

3,579,966
GRASS CATCHER ASSEMBLY
Stanley F. Allina, Ladue, Mo., assignor to The Perfection Manufacturing Company, St. Louis, Mo.
Filed Oct. 4, 1968, Ser. No. 765,080
Int. Cl. A01d *35/22*
U.S. Cl. 56—202 **8 Claims**



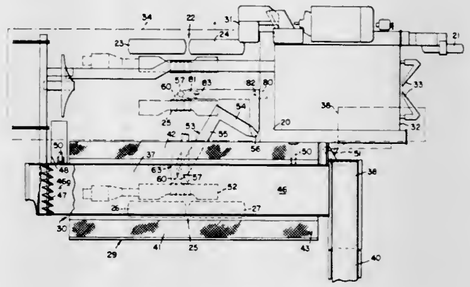
The grass catcher assembly includes a catcher bag having an open end and a closed end, the closed end being supported from the lawn mower by a cantilever support arm. The mouth of the catcher bag includes a split hoop wire frame stitched within the hem, the split frame includes opposed hook portions at each end. An adapter plate attached to the lawn mower housing above the discharge orifice includes engagement means in the form of a pair of spaced lugs. The split wire frame is sprung into interlocking engagement with the spaced lugs to hold the open end of the bag in overlapping relation with the discharge orifice.

3,579,967
GRAIN-LIFTER FOR GRAIN-CUTTING ASSEMBLIES
Gustav Schumacher, Eichelhardt, Haus Nr. 51, Germany
Filed Sept. 16, 1969, Ser. No. 858,479
Claims priority, application Germany, Sept. 18, 1968, Sept. 18, 1968, Aug. 12, 1969,
P 17 82 561.5, P 17 82 562.6 and P 19 40 955.3
Int. Cl. A01d *55/13*
U.S. Cl. 56—313 **8 Claims**



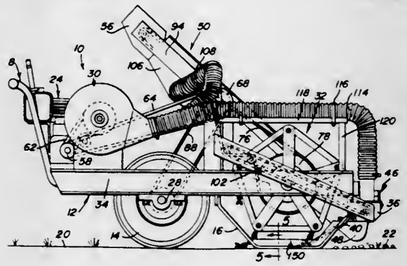
A grain lifter for a grain-cutting assembly of the type used, for example, in a harvester thresher and grain binder. A holder is engaged by a finger which is fastened thereto by a bolt and nut. This nut is formed with an annular groove, and a grain lifter has a springy supporting arm formed at its rear end with a notch which receives the part of the nut which is surrounded by the groove thereof with portions of the supporting arm on opposite sides of the notch thereof being received in said groove. This springy supporting arm of the grain lifter has a hook unit fixed thereto, and this hook unit extends around the finger and is pressed against the same by the springy action of the supporting arm when the rear end thereof is in the groove of the finger-fixing nut. The hook unit carries a blocking device which prevents automatic removal or unhooking of the hooking unit from the finger as a result, for example, of up-and-down movement of the springy supporting arm due to engagement of ground irregularities.

3,579,968
CROP HARVESTER ADJUSTABLE FOR DIFFERENT ROW SPACINGS AND FOR DIFFERENT TYPES OF FINIAL OPERATION
Fredrick L. Hill, Rio Vista; Lauren W. Gates, Concord, and William V. Colbert, Lodi, Calif., assignors to The Regents of the University of California
Filed Oct. 21, 1968, Ser. No. 769,053
Int. Cl. A01d *45/00*
U.S. Cl. 56—327 **24 Claims**



A crop harvester with a basic unit comprising a wheel-supported main frame, crop-pickup means, separating means for detaching the crop from the bearing plants, a collecting conveyor for receiving the detached crop and moving it rearwardly, and a cross conveyor at the rear for moving the collected crop to one side of the harvester. To this basic frame are attached, removably and one at a time, (1) a direct-loading conveyor, (2) a manual sorting unit, and (3) a mechanical sorting unit. Pivotal attachment enables folding whichever attachment is mounted on the basic unit. The basic unit also has means for varying the distance between one rear wheel unit and another between a minimum said distance and a maximum said distance, to accommodate different row spacings and to enable support of the sorting units when they are attached.

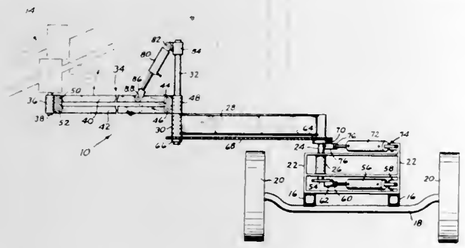
3,579,969
NUT HARVESTER
Eugene P. Richter, Jr., R.F.D. #2, Cairo, Ga.
Filed Oct. 30, 1969, Ser. No. 872,642
Int. Cl. A01d *51/00*
U.S. Cl. 56—328R **10 Claims**



Nuts lying on the ground are engaged by chain sections depending from a rotating reel so as to be dragged over a

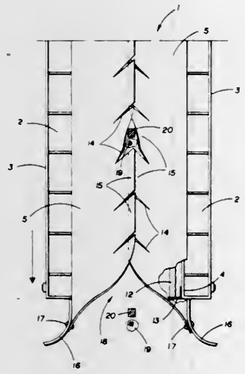
screen flap into a collection trough during forward movement of a mobile harvester frame on which the reel, flap and trough are mounted. The nuts are conveyed laterally through the trough to a delivery conveyor while being aerated.

3,579,970
ADJUSTABLE SUPPORT FOR TREE SHAKING APPARATUS
Edward I. Gilbert, deceased, late of Dallas; Edith M. Graff, Administratrix, Dallas, and William A. Rogers, Portland, Oreg. Said Edith M. Graff, administratrix assignor to Edith M. Graff
Continuation of application Ser. No. 641,951, May 29, 1967, now abandoned. Filed July 10, 1969, Ser. No. 871,763
Int. Cl. A01g *19/00*
U.S. Cl. 56—328 **9 Claims**



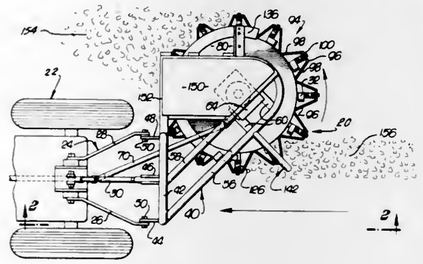
An adjustable support is designed for mounting tree shaking apparatus in a wide variety of positions as required to connect the apparatus to selected branches of fruit and nut trees about to be harvested. The support includes a base; a first vertical shaft is journaled on the base. A first horizontal arm has its inner end fixed to the first vertical shaft. A second vertical shaft is journaled on the outer end of the first horizontal arm. A second horizontal arm is keyed to the second vertical shaft. Mounting means on the outer end of the second horizontal arm mount the shaking apparatus. Drive means are provided for driving the arms independently of each other, as required to place the shaking unit in positions where it can reach the tree branches to which it is to be attached.

3,579,971
CATCH FLOOR FOR GRAPE HARVESTERS
Jean Sagouspe, and Eugene D. Riley, Los Banos, Calif., assignors to Genie Grape Harvester, Inc., Los Banos, Calif.
Filed Feb. 5, 1970, Ser. No. 8,944
Int. Cl. A01g *19/00*
U.S. Cl. 56—330 **10 Claims**



A longitudinal, transversely centrally peaked, detached-grape catch floor for a grape harvester of the type which straddles and moves along a row of grapevines growing on wires supported by posts; the catch floor, which is fashioned to permit the unobstructed relative passage therethrough of the posts and adjacent grapevine trunks with advance of the harvester, comprising—between transversely spaced, longitudinal side conveyors—two longitudinal panels of heavy-duty and flexible and resilient material disposed side-by-side with their inner edges lapped, and each thence inclining downwardly and laterally outwardly to its outer edge and to the corresponding side conveyor, and said panels each having therein a row of longitudinally spaced diagonal slits open to its inner edge whereby pairs of laterally mating flaps are formed on the panels. Such pairs of flaps yield upwardly in progression with the relative passage through the catch floor of each post and adjacent grapevine trunk, and then immediately return to their edge-lapped closed position. The panels are spring-finger supported from below, clear of the flaps, and out of the path through the catch floor of said posts and grapevine trunks.

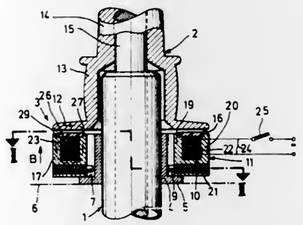
3,579,972
AGRICULTURAL IMPLEMENT
Levi L. Sears, Oxnard, and Richard N. Sommer, Pacoima, Calif., assignors to SSP Industries, Burbank, Calif.
Filed Apr. 18, 1969, Ser. No. 817,538
Int. Cl. A01d *79/00*
U.S. Cl. 56—370 **4 Claims**



An agricultural implement to be moved by a powered vehicle for collecting brush and cuttings and the like, into a single windrow. The implement includes a plurality of spring-steel tines arranged on a power-actuated revolving annular support, and cam means associated with said tines to move them from a vertical raking position to a discharging position.

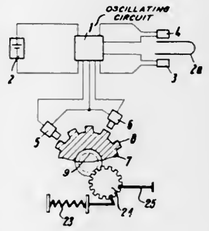
Further, a fender may be utilized for specific raking and discharging operations when the trees involved are citrus, to enable the implement to function under the tree skirts.

3,579,973
STOP MECHANISM FOR ROTARY TEXTILE SPINDLE
Gustav Fetzer, Gingen, and Gerhard Freytag, Faurndau, both of, Germany, assignors to Zinser-Textilmaschinen Gesellschaft Mit Beschrankter, Haftung, Ebersbach, Germany
Filed Feb. 25, 1969, Ser. No. 801,993
Claims priority, application Germany, Feb. 29, 1968, Feb. 1, 1969, P 17 10 059.3 and P 19 05 063.6
Int. Cl. D01h *7/22*
U.S. Cl. 57—88 **16 Claims**



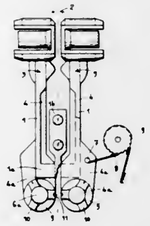
A rotary textile spindle is stopped by an electromagnetic brake means producing magnetic fields passing through the spindle and raising the brake means to a higher braking position, when energized. The brake means is nonrotatably mounted on the stationary support of the spindle, and is movable in axial direction to and from the braking position. In one embodiment, the spindle carries a freely rotatable driven pulley, and coupling means are provided which couple the pulley to the spindle when the electromagnetic brake means is deenergized and inoperative, and disengage the pulley from the spindle when the electromagnetic brake means is energized and brakes the spindle to a stop.

3,579,974
ELECTRONICALLY-CONTROLLED DRIVE MECHANISM PARTICULARLY FOR CLOCKS
Karl Schmidt, Achern, Baden, Germany, assignor to Firma GEHAP Gesellschaft fuer Handel und Patentverwertung mbH& Co. KG.,, Achern, Baden, Germany
Filed Apr. 8, 1968, Ser. No. 719,782
Claims priority, application Germany, Apr. 8, 1967, F33765
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 **13 Claims**



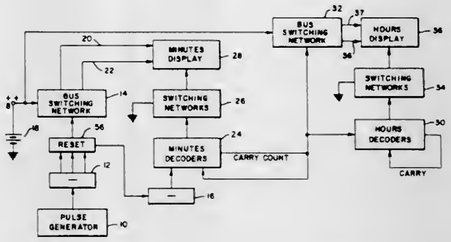
A drive mechanism for clocks includes a stabilized transistor oscillator. One or more drive coils within the oscillator circuit are located adjacent poles provided about the circumference of a rotor wheel mounted on the same shaft as a drive pinion. The magnetic interaction between the drive coils and the poles causes a rotation of the wheel.

3,579,975
FLEXURE-TYPE SYMMETRICAL OSCILLATOR
Rene Besson, and Remy Chopard, Neuchatel, Switzerland, assignors to Ebauches S.A.
Filed Aug. 25, 1969, Ser. No. 852,811
Claims priority, application Switzerland, Aug. 30, 1968, 13,112/68
Int. Cl. G04c *3/00*
U.S. Cl. 58—23 **2 Claims**



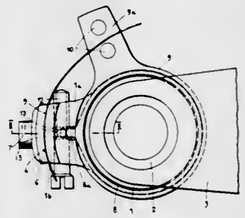
A flexure-type symmetrical oscillator for an electric timepiece, having a U-shaped part with two flexible limbs connected at their free ends to two rigid arms which in turn have counterbalancing masses at their free ends and drive transducers at the location where they are connected to the flexible limbs, the dimensioning of the arms and limbs being such that the instantaneous center of rotation thereof is substantially coincident with the center of gravity during flexure, whereby the frequency of the oscillator is substantially independent of changes of position and orientation of the oscillator with respect to gravity, means being provided which permits adjustment of the frequency of the oscillations of such an oscillator, like the regulator assembly of a conventional watch with balance-wheel and balance-spring, in view of the adjustments of the running of the watch.

3,579,976
ELECTRONIC TIMEPIECE
Thomas F. D'Muhala, Exeter Road, Lebanon, Conn.
Filed Nov. 21, 1969, Ser. No. 878,663
Int. Cl. G04b *19/32*
U.S. Cl. 58—50 **6 Claims**



A miniaturized electronic timepiece employing an electroluminescent display is disclosed. The indicia on the display are energized in the proper sequence through the use of logic circuitry and electronic switches controlled thereby.

3,579,977
REGULATOR-ASSEMBLY FOR TIMEPIECE
Andre Meylan-Rochat, Le Brassus, Switzerland, assignor to Parechoc S. A., Le Sentier, Vaud, Switzerland
Filed Aug. 4, 1969, Ser. No. 847,117
Claims priority, application Switzerland, Aug. 9, 1968, 12,019/68
Int. Cl. G04b *17/14;* **G04c** *7/00*
U.S. Cl. 58—112 **1 Claim**

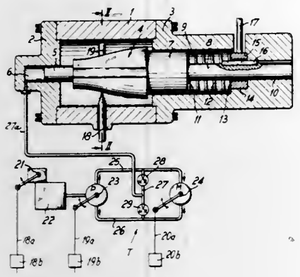


A regulator-assembly for a timepiece in which the regulator has a catch engaged in the groove of a tangential screw threaded in the frame of the clockwork in such a way that the angular position of the regulator is modified by rotating the screw, characterized by the fact that the catch is constituted by a thin elastic tongue urged, by its own elasticity, to apply itself against the bottom of the groove, the two terminal faces of the groove being frustoconical and opening towards the outside, the width of the bottom of the groove being less than that of the tongue, so that the tongue bears simultaneously on both frustoconical surfaces, wherefore the displacements of the screw, when they are carried out alternately in one direction and in the other, produce corresponding displacements of the regulator, without idle running.

3,579,978
HYDRAULIC DRIVE CONTROL ARRANGEMENT
Dietrich Stams, Sindelfingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed May 7, 1969, Ser. No. 822,381
Claims priority, application Germany, May 11, 1968, P1750545.2
Int. Cl. F02b *41/00*
U.S. Cl. 60—19 **12 Claims**

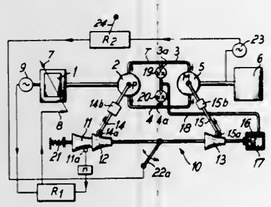
A drive for a car or machine comprises a combustion engine driving a hydrostatic pump-motor transmission. The fuel

supply of the combustion engine, the discharge volume of the pump, and the acceptance volume of the hydraulic motor are simultaneously adjusted by three cam followers under the control of three three-dimensional cam faces of a control



cam which is manually turned, and axially shifted distances depending on the hydraulic pressure in the hydrostatic transmission so that maximum efficiency and performance are obtained.

3,579,979
REGULATED HYDRAULIC DRIVE CONTROL APPARATUS
Paul Bosch, Ludwigsburg, and Walter Kobald, Stuttgart-Feuerbach, both of, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed June 4, 1969, Ser. No. 830,324
Claims priority, application Germany, June 5, 1968, P 17 51 471.5
Int. Cl. F15b *15/18*
U.S. Cl. 60—19 **12 Claims**



A hydraulic drive includes a prime mover and a hydraulic pump-motor transmission which are respectively adjusted to correlated desirable operational conditions by three three-dimensional cam surfaces of a control cam. A speed regulator means compares a desired output speed with the actual output speed of the prime mover and preferably also of the hydraulic motor, and adjusts the drive accordingly.

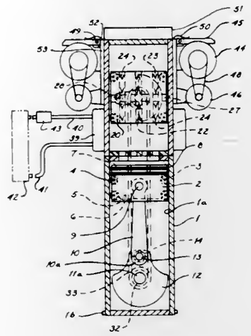
3,579,980
UNIFLOW STIRLING ENGINE AND FRICTIONAL HEATING SYSTEM
Donald A. Kelly, 58-06 69th Place, Maspeth, N.Y.
Filed Nov. 10, 1969, Ser. No. 875,252
Int. Cl. F03g *7/06*
U.S. Cl. 60—24 **8 Claims**

The Uniflow Sterling engine consists of multiple power and displacer sections which are arranged in in-line form. The in-line arrangement allows for the ganging of the piston sets so that a simple modular, easily-serviced engine is produced.

Hot and cold conduction rods within the thermal zones aid in transferring heat within the displacer sections.

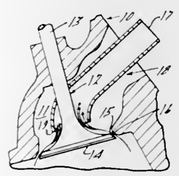
Alternating one-way gas flow bores within the displacer blocks provide a uniflow gas flow loop for improved thermal effectiveness.

A frictional heating system is advocated as a sustaining heating means, which utilizes an electric motor and battery



system to drive a friction drum against replaceable heat transfer elements to produce sufficient heat energy for the hot displacer zone.

3,579,981
ANTI-POLLUTION EXHAUST VALVE COMBINATION WITH FLUIDIC CONTROL AND VALVE COOLING FEATURES
Leonard P. Gau, Birmingham, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Continuation-in-part of application Ser. No. 802,944, Feb. 27, 1969, now abandoned. Filed May 6, 1970, Ser. No. 35,051
Int. Cl. F01n *3/00*
U.S. Cl. 60—29 **9 Claims**

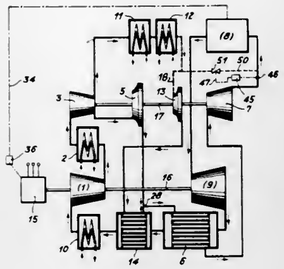


Several embodiments showing collector arrangements disposed about exhaust valves in the cylinder head of internal combustion engines for collecting at least part of the unburned hydrocarbons from the engine exhaust. Fluidic deflection control ports are included in some embodiments to provide directional control over the flow of exhaust gases and cooling of the valves.

3,579,982
GAS TURBINE POWER PLANT INCLUDING A NUCLEAR REACTOR AS HEAT SOURCE
Rene Strub, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland
Filed July 29, 1968, Ser. No. 748,555
Claims priority, application Switzerland, July 27, 1967, 10681/67
Int. Cl. F01k *25/00, 3/18*
U.S. Cl. 60—36 **1 Claim**

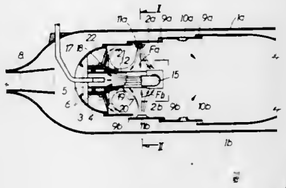
There is disclosed a closed cycle CO_2 gas turbine power plant in which part of the CO_2 flow downstream of an intermediate level compressor is condensed prior to pumping to higher pressure and in which heat is applied to the CO_2 from a nuclear reactor in a heating step between successive expan-

sions, and in which for control of pressure in the reactor a line is provided, with adjustable flow control means therein



responsive to reactor inlet pressure, connecting the outlet of the condenser with the inlet to the reactor.

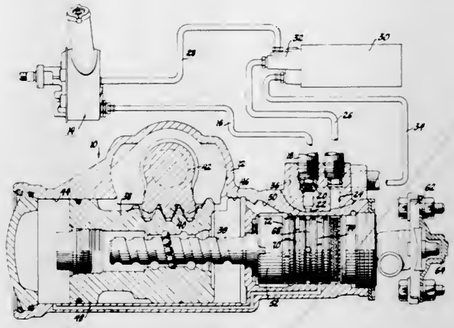
3,579,983
IMPROVEMENTS IN OR RELATING TO COMBUSTION CHAMBERS
Jacques Emile Jules Caruel, Dammarie-les-Lys; Herve Alain Quillevere, Issy-les-Moulineaux, and Louis Jules Bauger, Vanves, France, assignors to Societe Nationale D'Etude Et De Construction De Moteurs D'Aviation, Paris, France
Filed May 5, 1969, Ser. No. 821,794
Int. Cl. F02g *1/00*
U.S. Cl. 60—39.71 **1 Claim**



An annular combustion chamber comprising a plurality of ducts adapted to inject axially in an upstream direction a gasiform mixture containing vaporized fuel, each duct being associated with a pair of radial nozzles adapted to inject into said chamber two air jets directed toward one another, the geometrically defined area in which the jets are to meet being located at the outlet end of said duct.

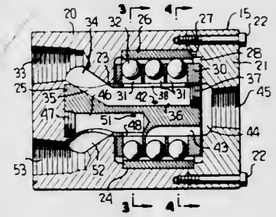
3,579,984
FLUID POWER STEERING SYSTEM WITH FLUID PRESSURE RESERVE
Robert P. Rohde, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed June 4, 1969, Ser. No. 830,241
Int. Cl. F15b *1/02, 15/18*
U.S. Cl. 60—51 **2 Claims**

A reserve supply of fluid pressure is provided for a vehicle fluid power steering system including an accumulator kept charged to a predetermined minimum pressure and communicated to the fluid power steering gear in parallel with the normal or primary pump source of pressure fluid. The rotary control valve for the fluid power gear includes a primary set of open center configuration lands and grooves operable over a normal steering travel range in the valve to selectively pressurize either side of the fluid motor, and a further set of closed center configuration lands and grooves communicated to the accumulator fluid pressure but normally blocking communication between the accumulator and the fluid motor



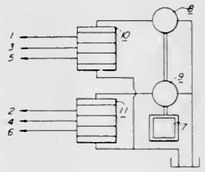
until normal steering travel is exceeded in either direction of actuation, as during failure of the primary pump.

3,579,985
PRESSURE INTENSIFIER
George M. Barrett, R.R. #5, Galt, Ontario, Canada
Filed Apr. 25, 1969, Ser. No. 819,154
Int. Cl. F15b *3/00, 15/18*
U.S. Cl. 60—52 **3 Claims**



This disclosure relates to a hydraulic system incorporating a pressure intensifier which is a combination motor and pump and wherein the pressure intensifier has two discharge sources, one discharge source being a free discharge to a reservoir and the other discharge source being a high pressure discharge to a motor, the pressure intensifier being of the piston and cylinder type with the pistons being freely mounted within the cylinders and being associated with a cam so as to provide the required motor and pumping action.

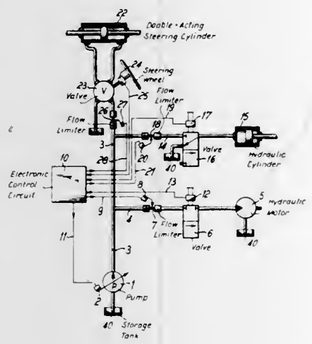
3,579,986
DEVICE FOR CONTROLLING PUMPS FOR OPERATING HYDRAULIC MOTORS
Katsuro Abe, Matsudo-shi; Saburo Kakinuma, Kashiwa-shi, and Masaaki Uno, Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed June 6, 1969, Ser. No. 830,940
Claims priority, application Japan, Sept. 6, 1968, 43/63756
Int. Cl. F15b *15/18*
U.S. Cl. 60—52 **3 Claims**



A device for controlling pumps for operating hydraulic motors comprising at least two variable displacement pumps,

valve means for each said pump disposed between the discharge side of the pump and the hydraulic motors for switching a charge of hydraulic fluid delivered to the hydraulic motors upon operation of an operating lever, and a hydraulic servomechanism for each said pump operated by a control lever coupled to said operation lever for moving a discharge flow control member of the pump, said servomechanism having a control circuit including a first control valve operated by said control lever for forming a flow of hydraulic fluid therethrough to move said discharge flow control member of the pump to a position corresponding to the amount of operation of the control lever, and a second control valve responding to the discharge pressure of the pump for forming another flow of hydraulic fluid therethrough to move said discharge flow control member of the pump to a position corresponding to the discharge pressure of the pump.

3,579,987
ADJUSTABLE HYDRAULIC OPERATION ARRANGEMENT
Herbert Busse, Stuttgart-Stammheim, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed Oct. 2, 1969, Ser. No. 863,211
Claims priority, application Germany, Oct. 4, 1968, P 18 01 13.5
Int. Cl. F15b *11/16*
U.S. Cl. 60—52 **10 Claims**



A hydraulic arrangement in which a pump is adjustably set to supply pressurized fluid to a number of different hydraulically operated devices with different operating requirements. Each of the devices has connected in front of it a control valve which is, in turn, connected in series with a flow limiter. The control valves have position indicators which transmit signals indicative of the valve position. The flow limiters and the pump are settable through electrical signals derived from an electronic control circuit. The control circuit applies the setting signals to the pump and flow limiters in response to the electrical signals received from the valve position indicators.

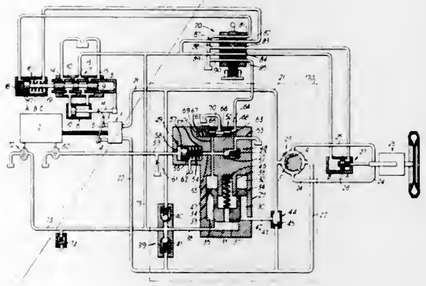
3,579,988
HYDROSTATIC TRANSMISSION CONTROL SYSTEM
Donald Firth; Roger Harvey Yorke Hancock, and James McCallum, East Kilbride, Glasgow, Scotland, assignors to National Research Development Corporation, London, England
Filed Mar. 24, 1969, Ser. No. 809,492
Claims priority, application Great Britain, Mar. 25, 1968, 14374/68
Int. Cl. F16d *31/06;* **B60k** *7/00*
U.S. Cl. 60—53 **12 Claims**

A hydrostatic pump-and-motor transmission system, e.g. for a vehicle, in which the pump and the motor can have their displacement volumes varied in discrete steps to give a number of predetermined fixed ratios.

The pump is either a swashplate or variable eccentric pump adjustable to and between predetermined settings, or, a plurality of fixed displacement pumps switchable on the hydraulic side between, e.g. small pump alone, large pump alone, both pumps together.

The motor is either a multibank piston/cylinder motor with valving arrangements for cutting out one bank of cylinders from the fluid supply, or several separate motors —some disconnectable.

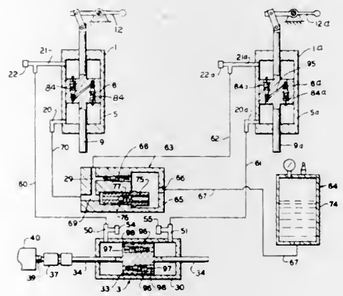
A hand selector sets up the various conditions e.g. three alternative pump displacement values with the motor at max-



imum displacement and two conditions with the motor at minimum displacement and the pump at two of the three pump displacement values.

Instead of using multibank motors and cutting out one bank, four motors on four wheels of a vehicle may give the maximum motor displacement condition, the motors of either the front or the rear wheels being cut off from the pump, for the minimum motor displacement condition.

3,579,989
LINEAR SELF-SYNCHRONIZING MASTER-SLAVE HYDRAULIC REMOTE CONTROL DEVICE
Donald A. Stark; Ernest A. Di Bartolo; Harry A. Feather, and Charles H. Sundin, Sarasota, Fla., assignors to Fluid Controls, Inc., Mentor, Ohio
Filed Apr. 15, 1969, Ser. No. 816,231
Int. Cl. F15b *7/00*
U.S. Cl. 60—54.5 **10 Claims**

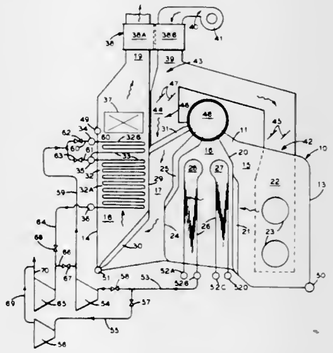


A plurality of manually operable master piston and cylinder assemblages and one or more slave piston and cylinder assemblages are connected in series with each other in a closed hydraulic circuit continuously pressurized at low pressure by way of an accumulator.

Each master assemblage has a valving bypass circuit such that when the piston is manually driven it functions as a conventional piston. When it is driven by a differential in the fluid pressures applied to its opposite faces, it functions as a conventional piston until it closely approaches the ends of its strokes in opposite directions, respectively, whereupon the valving bypass circuit is rendered operative and bypasses the pressure fluid around the piston from one end of the cylinder to the opposite end. This renders the device self-synchronizing simply by manual movement of one of its master pistons

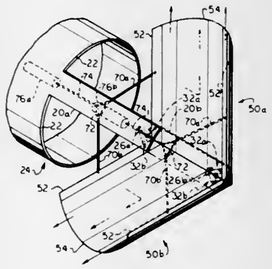
through a complete forward and return stroke. Relief of excess pressures, and reduction of, and compensation for, thermal expansion and contraction are provided.

3,579,990
VAPOR GENERATOR
Richard A. Grams, Medina, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.
Filed Apr. 3, 1969, Ser. No. 813,166
Int. Cl. F01k *7/16*
U.S. Cl. 60—73 **4 Claims**



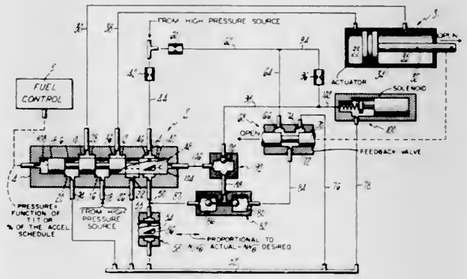
An improved marine vapor generator of the type which includes a reheater and the means for tempering the heating gases flowing toward the reheater. The tempering means operates to control the reheater outlet steam temperature during ahead operation and to protect the reheater tube metal during astern operation of the ship propulsion system. The tempering means includes a duct arranged to discharge a regulable quantity of heated combustion air into the heating gases flowing toward the reheater. An alternative arrangement uses unheated combustion air as the tempering agent. A third arrangement uses low temperature gases as the tempering agent and includes a gas recirculating fan.

3,579,991
THRUST REVERSING APPARATUS FOR JET-PROPELLED AIRCRAFT
Harold E. Nelson, Jr., Chula Vista, Calif., assignor to Rohr Corporation, Chula Vista, Calif.
Filed Jan. 8, 1970, Ser. No. 1,510
Int. Cl. F02k *1/24*
U.S. Cl. 60—232 **4 Claims**



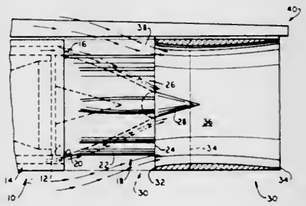
Thrust reversing doors are mounted on an aircraft jet engine housing by means of links each pivoted at one end to the housing and pivoted at its other end to the aft portion of one of the two side edges of a respective one of the doors. Means are provided to limit the rotation of the links relative to the housing and the rotation of the doors relative to the links. Drive links are connected to the doors and to actuators which are mounted on the housing and which can be operated to thereby move the doors between stowed and deployed positions relative to the housing.

3,579,992
POWER PLANT VARIABLE GEOMETRY CONTROL
Louis A. Urban, Granby, Conn., and Charles F. Stearns, East Longmeadow, Mass., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Jan. 3, 1969, Ser. No. 788,856
Int. Cl. F02k *1/16, 1/18*
U.S. Cl. 60—239 **10 Claims**



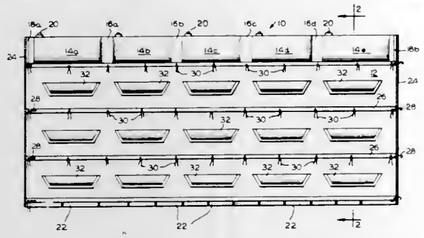
Means for controlling the variable geometry of a gas turbine engine having a mechanism for varying the power turbine stator geometry or the gas generator exhaust nozzle geometry to achieve maximum acceleration time by matching the geometry of the engine to the acceleration and droop schedules of the fuel control.

3,579,993
SOUND SUPPRESSION SYSTEM
Carole S. Tanner, and Remo Tontini, San Diego, Calif., assignors to Rohr Corporation, Chula Vista, San Diego, Calif.
Filed Aug. 4, 1969, Ser. No. 847,052
Int. Cl. F02k *3/04;* **B64d** *33/06*
U.S. Cl. 60—262 **2 Claims**



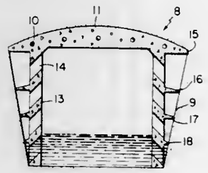
System includes a nozzle connected to turbine exhaust outlet to confine and direct gas stream. Nozzle is corrugated to form peripherally spaced radially extending lobes to divide gas into small jet streams. Conduit surrounds exhaust outlet and discharges to exterior of nozzle, and fan air flows through passages between lobes to meet gas streams at exit margin of nozzle. Shroud or ejector sleeve defines and surrounds a mixing zone aft of the exit margin. Leading edge of shroud is spaced aft of fan air conduit to provide annular flow path for entry of ambient air to surround and mix with fan air and gas. Shroud is retractable to surround nozzle in spaced relation and prevent dispersion of fan air before mixing in normal cruising flight.

3,579,994
BARRIER FOR CONTROL OF SUBSTANCES IN BODIES OF WATER
Paul Preus, Smith Road, and Charles E. Rosendahl, Flag Point, Toms River, N.J.
Filed Jan. 17, 1969, Ser. No. 792,074
Int. Cl. E02b *15/04*
U.S. Cl. 61—1 **3 Claims**



A barrier for control of waterborne substances having a plurality of units interconnected to one another in end to end relationship. Each unit has articulated flotation chambers and a flexible, depending skirt with permanent ballasting along the lower edge thereof. Means are provided to selectively reef the skirt and water ballasting pockets are formed on the skirt to provide restraint against wind action on the barrier.

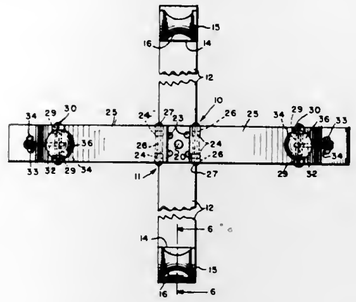
3,579,995
VENTED LEACHING CHANNEL
John F. Flynn, 358 Strawberry Hill Road, Concord, Mass.
Filed June 10, 1969, Ser. No. 831,881
Int. Cl. E02b *13/00*
U.S. Cl. 61—13 **3 Claims**



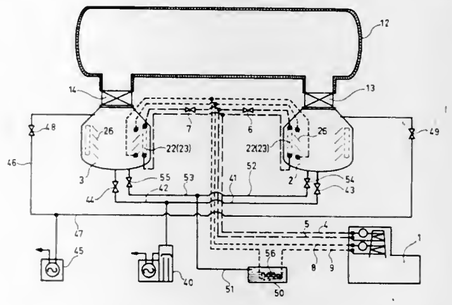
This invention relates to sewage systems, FIG. 3, it particular to a vented leaching channel for use in such systems. A plurality of vented leaching channels are arranged in a corresponding plurality of trenches in the leaching field of a sewage system so as to control the flow of sewage and to form a volume underground for storage output during aerobic action thereon. Each leaching channel comprises a series of leaching channel units arranged end-to-end, the first unit having an end cover adapted to receive the sewage and the last unit having a vent. Except for the end cover and vent, the units are identical for ease of manufacture and installation, and each includes a barn or shedlike structure having sheltered apertures in its walls adapted to permit outward flow of sewage while preventing inward flow of dirt and other undesirable material. Special access apertures are also provided in all the units.

3,579,996
PORTABLE BOAT RAMP
Jerry W. Edson, Wichita, Kans. (R1 Clearwater, Kans. 67026)
Filed Sept. 5, 1969, Ser. No. 855,623
Int. Cl. B63c *1/00, 3/12*
U.S. Cl. 61—66 **7 Claims**

A portable boat ramp for beaching or launching small boats which eliminates the need to drag such boats across a sandy or rocky beach with resulting damage to the hull. The ramp may be conveniently carried manually and is capable of being quickly adjusted between an extended operative position and a folded position for storage or transportation. Adjustable bolsters are provided for engaging hull sides of different configurations and cooperate with a stabilizing bar which is disposed therebeneath to provide a stable support for a boat while supported on the ramp.



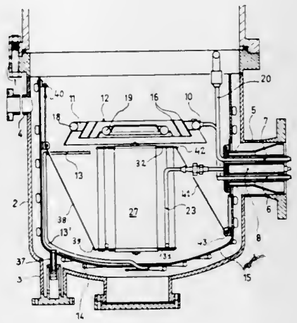
3,579,997
CRYOPUMPING INSTALLATIONS WITH HIGH FLOW-RATES
Michel Rapinat, Fontaine, France, assignor to L'Air Liquide, Societe Anonyme pour L'etude et L'exploitation, des procedes Georges Claude
Filed July 10, 1969, Ser. No. 840,734
Claims priority, application France, July 30, 1968, 161,161
Int. Cl. B01d *5/00*
U.S. Cl. 62—55.5 **12 Claims**



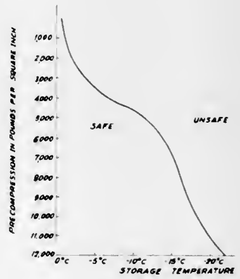
A cryopump is constituted by a fluidtight casing inside which is arranged a plurality of condensation plates carried by a cooling coil supplied with very cold fluid, the whole disposed externally of and around a baffle formed by a plurality of frustoconical rings arranged in the extension of a stop valve. The baffle is preferably cooled by a moderately cold fluid (80°K) though conduits, while a coil embedded in the wall of the casing and traversed by a moderately cold fluid cools an internal wall of the casing. This cryopumping device is adapted to extract high flow rates at a relatively moderate pressure of the order of 10^{12} torr.

3,579,998
CRYOGENIC PUMPING DEVICE FOR THE CREATION OF VERY HIGH VACUA
Jean-Jacques Thibault, Saint-Martin D'Uriage, and Jean-Claude Boissin, Montbonnot-Saint-Martin, France, assignors to L'Air Liquide, Soclete Anonyme pour L'Etude et L'Exploitation, des procedes Georges Claude
Filed July 25, 1969, Ser. No. 844,779
Claims priority, application France, Aug. 1, 1968, 161,426
Int. Cl. B01d *5/00*
U.S. Cl. 62—55.5 **7 Claims**

A cryogenic pumping device for the creation of very high vacuum, comprising means for collecting gases at very low temperature, said collecting means including adsorption means and condensation means, the condensation means being located upstream of the adsorption means with respect to the travel of the gases, the whole being housed in a casing cooled to a moderately low temperature and formed, on the side of the passage communicating with the chamber to be pumped, by a baffle adapted to form a screen against external radiation. The adsorption means are mounted on an extension of a metal wall which forms the condensation means, each metal wall being adjacent to a segment of a cooling coil through which is circulated a fluid at very low temperature.

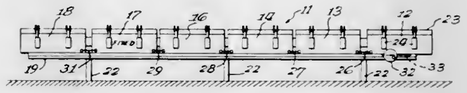


3,579,999
METHOD AND APPARATUS FOR THE PRESERVATION OF BIOLOGICAL SUBSTANCES
Ralph E. Schwartz, Lindenhurst, N.Y., assignor to Redeco, Inc., East Islip, L. I., N.Y.
Filed Aug. 8, 1968, Ser. No. 757,195
Int. Cl. A61m *1/02*
U.S. Cl. 62—56 **8 Claims**



Biological substances such as blood are stored under pressure at below 0° C. temperatures, in a substantially nondilatable vessel. Upon being introduced into the vessel, the temperature of the vessel and the blood are reduced to 4° C.; when equilibrium has been achieved the blood within the vessel is precompressed at a controlled rate several thousand pounds per square inch by the application of mechanical leverage to a vessel piston. Thereafter, the vessel and blood are reduced to a final temperature from 0° C. to −21° C. This temperature reduction, because of the conjunctive effect of the volumetric expansion of the blood and nondilation of the vessel, self-generates a pressure from 15 to 35,000 p.s.i. The vessel may now be stored at the final temperature and the blood within it maintained without deleterious effects.

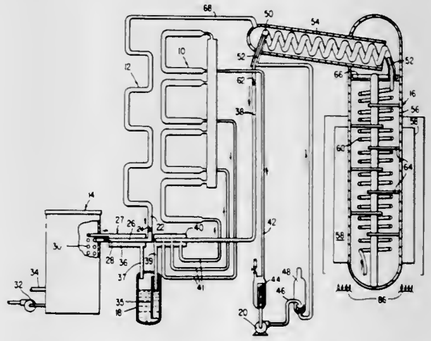
3,580,000
CHAMBER FOR FOOD TREATING APPARATUS
Richard C. Wagner, Clarendon Hills, Ill., assignor to Integral Process Systems, Inc.
Filed Mar. 17, 1969, Ser. No. 807,904
Int. Cl. F25d *3/10, 25/04*
U.S. Cl. 62—77 **11 Claims**



To provide for the ease of cleaning of an elongated food treating chamber, such as a flash freezing chamber, which contains a conveyor for the passage of food therethrough, means are provided for separating the chamber into sections, opening a lid portion of each section and lifting the conveyor out of the chamber by means of lifting jacks which pass through the spaces between the separated sections.

Another aspect of the invention provides means for accommodating differential thermal expansion or contraction of inner and outer walls of the chamber section by connecting said inner and outer walls only by cover caps and end caps which are slidably attached thereto.

3,580,001
ABSORPTION REFRIGERATION MACHINE WITH CONCENTRATION CONTROL TANK
Keith V. Eisberg, Martinsville, Ind., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Sept. 3, 1968, Ser. No. 756,783
Int. Cl. F25b *15/04*
U.S. Cl. 62—101 **4 Claims**

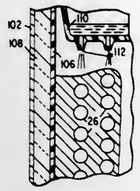


An absorption refrigeration system employing a liquid storage tank to vary the concentration of refrigerant in the solution supplied to the absorber under varying ambient temperature operating conditions.

3,580,002
FREEZE LIMITING ABSORPTION REFRIGERATION MA[illegible]NE
John T. Fisher, Indianapolis, In[illegible], assignor to Carrier Corporation, Syracuse, N.Y.
Filed June 7, 1968, Ser. N[illegible] 735,380
Int. Cl. F25b *15/04, 3[illegible]2*
U.S. Cl. 62—101 **2 Claims**

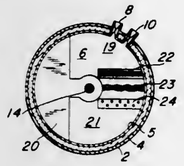
An absorption refrigeration system utilizing chilled water as a heat exchange medium. The system includes a chiller

which provides reduced heat exchange area upon a drop in ambient air temperature by selectively block water flow



paths between the chiller coils by the formation of ice to prevent complete freezeup of the chiller.

3,580,003
COOLING APPARATUS AND PROCESS FOR HEAT-ACTUATED COMPRESSORS
Joseph P. Dolan, Chicago, Ill., assignor to The Institute of Gas Technology, Chicago, Ill.
Filed Aug. 14, 1968, Ser. No. 752,710
Int. Cl. F25b *1/00*
U.S. Cl. 62—115 **18 Claims**



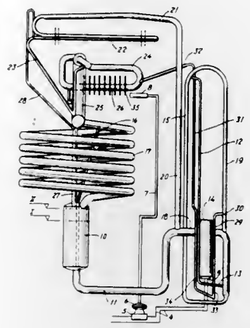
Apparatus and process for cooling heat-actuated engines or compressors by use of boiling refrigerant, especially suitable for use with heat-actuated regenerative compressor systems used in conjunction with a condenser-expansion-compression cooling cycle.

ERRATUM

For Class 62—148 see:
Patent No. 3,580,013

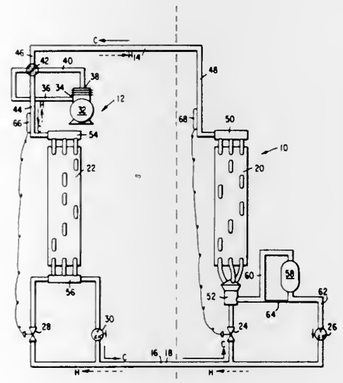
3,580,004
APPARATUS FOR DEFROSTING COOLING UNITS OF ABSORPTION REFRIGERATION SYSTEMS
Wilhelm Georg Kogel, Stockholm, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden
Filed Nov. 18, 1968, Ser. No. 776,535
Claims priority, application Sweden, Nov. 17, 1967, 15818/67
Int. Cl. F25b *15/10*
U.S. Cl. 62—148 **6 Claims**

This invention relates to an absorption refrigeration system of the inert gas type including cooling structure having low and higher temperature cooling elements to which refrigerant is supplied from a vapor expulsion unit having a heat receiving part from which heat is derived for expelling refrigerant vapor from absorption liquid. The vapor expulsion unit includes a first pump for lifting liquid by vapor-liquid lift action to effect normal circulation of absorption liquid during operation of the system. The heat receiving part is heated by a source of heat controlled by a thermostat affected by the temperature of the higher temperature cooling element either to render said first pump operable to circulate absorption liquid or to render it inoperable to stop circulation of the liquid. The absorption liquid circuit has a part at a level normally free of liquid and above the liquid surface level therein when normal circulation of liquid is effected and at a level below the liquid surface level in the circuit when normal circulation of liquid has stopped. The important feature of the invention resides in providing a second pump for lifting liquid by vapor-liquid lift action by heat which also is derived from the heat receiving part and is connected to the one part to receive liquid therefrom when circulation of absorption liquid has stopped. Fluid raised by the second pump is con-



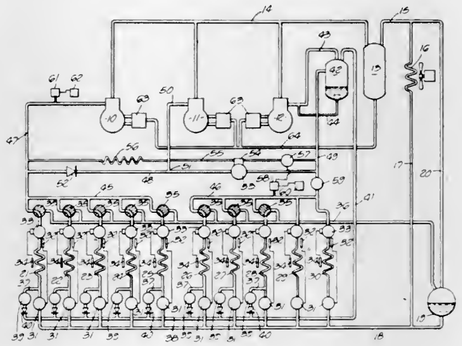
ducted to the higher temperature cooling element to melt frost which tends to form thereon.

3,580,005
REFRIGERATION SYSTEM
Harry T. Hale, Bridgeport, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Apr. 1, 1969, Ser. No. 812,215
Int. Cl. F25b *45/00*
U.S. Cl. 62—149 **2 Claims**



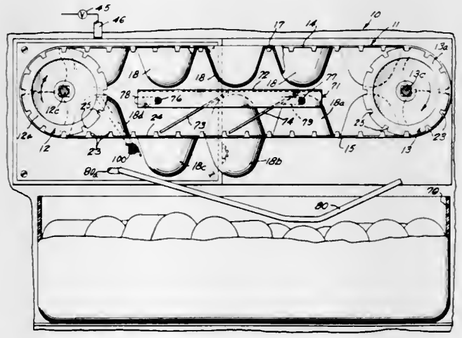
The present invention is directed to refrigeration systems of the type referred to in the art as heat pumps comprising a compressor, a pair of series-connected heat exchangers, reversing valve means for reversibly connecting the compressor to the heat exchangers for effecting flow of refrigerant through a portion of the circuit in either direction, refrigerant flow control means in the circuit, and a refrigerant container or receiver connected between the two heat exchangers for storing a portion of the refrigerant charge during operation of the system, the container being so constructed and arranged as to readily accommodate varying charge imbalances in the system and also having in communication therewith tubular means for effecting essentially complete removal of oil entrapped in the container and its return to the compressor when the system is reversed from the heating to the cooling cycle, thereby assuring an adequate supply of oil in the compressor for lubrication purposes.

3,580,006
CENTRAL REFRIGERATION SYSTEM WITH AUTOMATIC STANDBY COMPRESSOR CAPACITY
Lester K. Quick, 868 Westview Crescent, Vancouver, British Columbia, Canada
Filed Apr. 14, 1969, Ser. No. 815,866
Int. Cl. F25b *5/00*
U.S. Cl. 62—196 **18 Claims**



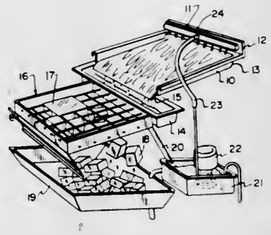
A central refrigeration system for supermarkets and the like requiring two or more temperature levels of refrigerated fixtures wherein separate compressors operate the fixtures at different temperature levels and with only one or two large compressors for each temperature level. The system employs a single condenser-receiver for the refrigerant discharged from all of the compressors and a single oil separator for returning oil to the compressors. A control arrangement responsive to an abnormal increase in the suction pressure on a given compressor automatically operates a valving arrangement to transfer at least a portion of the refrigerant load on that compressor to another compressor normally operating fixtures at a different temperature level.

3,580,007
BELT-DRIVEN ICE MAKER
Carl C. Bauerlein, Clearwater, Fla., assignor to Eaton Yale & Towne Inc.
Division of Ser. No. 702,914, Feb. 5, 1968.
and this application Aug. 22, 1969, Ser. No. 870,711
Int. Cl. F25c *1/10*
U.S. Cl. 62—345 **5 Claims**



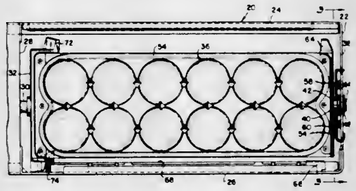
An automatic ice cube maker including a sprocket-driven endless belt having a plurality of flexible invertible ice cube forming cup-shaped members or cells formed therein. A water-fill station and an ice cube harvest station are situated respectively adjacent upper and lower horizontal reaches of the belt. A stallable electric motor drives the sprockets through a gear train to move the belt continuously through a looped path of travel and past the water-fill and ice-harvest stations. A water supply mechanism for filling the cells with water comprises a pair of alignable cooperating cams which are connected to different ones of the gears of the gear train for rotation at different speeds. A water control switch controls the operation of the water supply mechanism so that a predetermined amount of water is supplied to each of the cells as each cell passes through the water-fill station in timed relation with the alignment of the cams. Rigid abutment members are provided at the harvest station to invert the cells or cup-shaped members or turn them inside out to remove the frozen cubes therefrom. A spring-biased member is provided beyond the harvest station to reinvert or return the cup-shaped members to the original position thereof. The spring bias member includes a stripper for ensuring complete removal of the cubes from the cells. An ice level sensing mechanism is also driven by the gear train to physically stop the rotation of the motor when the ice at the harvest station has attained a predetermined level, but only when the cam members are out of alignment with one another and the water control switch is inoperative to avoid overflowing of the cup-shaped members at the water-fill station.

3,580,008
ICEMAKER WITH WATER DISTRIBUTOR
Walter C. Barnard, White Bear Lake, and Donald C. Hodapp, St. Paul, Minn., assignors to Whirlpool Corporation
Filed Apr. 24, 1969, Ser. No. 818,973
Int. Cl. F25c *1/12*
U.S. Cl. 62—347 **16 Claims**



An icemaker having a refrigerated member over a surface of which water is directed to form an ice slab and including a water distributor with an internal reservoir means for receiving water and a plurality of outlets for distributing water along the width of the ice slab portion of the refrigerated member and flow-impeding means in the reservoir for impeding flow of water through the reservoir for achieving substantially even distribution of water within the reservoir means before flow through the outlet means in order that the water distribution is even onto the refrigerated member to aid in the formation of an ice slab of substantially uniform thickness.

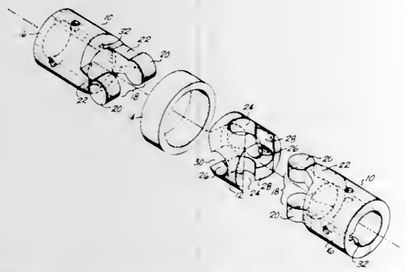
3,580,009
ICE MAKER
Lawrence E. Snow, Greenville, Mich., assignor to White Consolidated Industries, Inc., Greenville, Mich.
Filed Jan. 13, 1969, Ser. No. 790,820
Int. Cl. F25c *1/10*
U.S. Cl. 62—353 **1 Claim**



An automatic icemaker in which a flexible ice tray is twisted to loosen the ice cubes by unidirectional rotation of

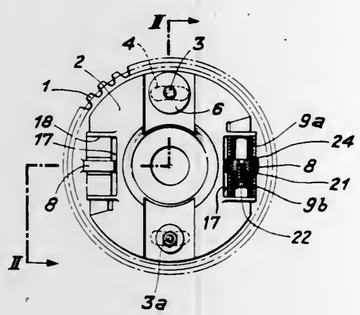
one end of the tray while rotation of the opposite end of the tray is temporarily restrained and a reverse twist force is imparted to the tray by relatively accelerating the other end of the tray before the tray is returned to its normal upright position.

3,580,010
UNIVERSAL JOINT
Sidney L. Fisher, Renton, Wash., assignor to Spider Staging, Inc., Seattle, Wash.
Filed Sept. 29, 1969, Ser. No. 861,866
Int. Cl. F16d *8/18*
U.S. Cl. 64—9 **7 Claims**



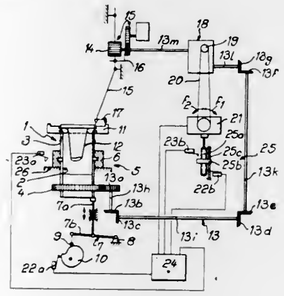
The essential components are a pair of identical end members, a coupler member, and a retainer ring. Each end member is connectable to the shaft part and includes cylindrical pivot head means having an axis perpendicular to the main axis of the end member. The coupler member comprises a pair of transverse socketways, each of which is circular in cross section and extends perpendicular to the other socketway. The head means of one end member is slid axially into one of the socketways and the head means of the other end member is slid axially into the second socketway. A retainer ring is slid longitudinally over one of the end members into a position surrounding the coupler member in which said ring covers the end openings of the socketways.

3,580,011
COUPLING
Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland
Continuation-in-part of application Ser. No. 676,590, Oct. 19, 1967, now abandoned. This application Nov. 24, 1969, Ser. No. 879,135
Int. Cl. F16d *3/14*
U.S. Cl. 64—27 **2 Claims**



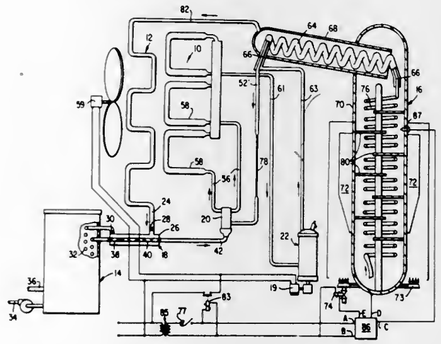
A coupling for the transmission of torques comprises two discs and means to permit limited relative rotation of the discs, with friction between them. For restoration of an equilibrium relative angular position of the discs, there are oppositely acting separate circumferentially disposed springs of adjustable prestress engaged between the two discs. In another embodiment each of the springs is permitted to undergo compression but not expansion, and the prestressed compression of the springs undergoing compression for one sense of relative rotation of the discs is greater than the maximum force of friction between the discs so that upon release of the discs they will be restored to their equilibrium relative angular position notwithstanding the force of friction.

3,580,012
DEVICE FOR CONTROLLING THE DELIVERY OF THREAD TO A KNITTING MACHINE
Eugene Voisin, Souligny; Jean-Pierre Raisin, Troyes, and Jean-Paul Delair, Troyes, France, assignors to Centre Technique Industrial dit, Institut Textile De France, Boulogne, S/Seine, France
Filed Sept. 19, 1969, Ser. No. 859,416
Claims priority, application France, Sept. 23, 1968, 167,161
Int. Cl. D04b *15/48*
U.S. Cl. 66—55 **3 Claims**



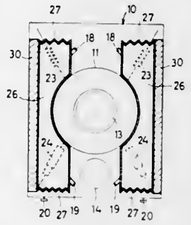
A device for controlling the delivery of thread to a knitting machine comprises a speed variator which is connected to a mechanical transmission extending between a cylinder and thread furnisher of the knitting machine, and a motor which controls the variator. The motor is reversible in forward and reverse directions and has two pairs of switches which start and stop the motor in both directions. The starting switches are operated by a control cam and programming element of the knitting machine. A follower device is provided whose travel corresponds to a predetermined length of fabric produced by the knitting machine and this follower device operates the stopping switches.

3,580,013
ABSORPTION REFRIGERATION MACHINE WITH GENERATOR LEVEL CONTROL
Gary W. Ballard, Liverpool, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed June 2, 1969, Ser. No. 829,622
Int. Cl. F25b *15/04*
U.S. Cl. 62—148 **5 Claims**



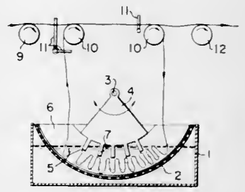
An absorption refrigeration system including an electronic control circuit employing a level sensing probe to prevent operation of the absorption refrigeration system heating means when the probe is not submerged in absorbent solution.

3,580,014
MACHINE HAVING A ROTARY MOTION, ESPECIALLY WASHING MACHINE, FURNISHED WITH BALLAST
Lamberto Mazza, Pordenone, Italy, assignor to Industrie A. Zanussi S.p.A., Pordenone, Italy
Filed Jan. 22, 1969, Ser. No. 792,962
Claims priority, application Italy, Feb. 13, 1968, 12701A/68
Int. Cl. D06f *37/22*
U.S. Cl. 68—23.1 **8 Claims**



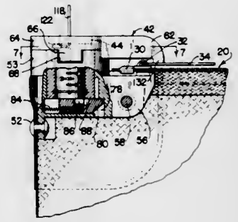
A machine having a unidirectional or reciprocating rotary motion, such as a washing machine, wherein a container is provided which can be charged with a ballast material, preferably water, in order to dampen the oscillations and vibrations transmitted to the whole machine during its operation, the ballast material being dischargeable to facilitate the transport and the handling of the machine.

3,580,015
DEVICE FOR TREATING TEXTILE FABRIC
Hajime Horie; Tadao Hirano, and Tokihide Suzuki, Fukui-ken, Japan, assignors to Fukui Seiren Kako Kabushiki Kaisha Keya, Fukui-shi, Fukui-ken, Japan
Filed Aug. 15, 1969, Ser. No. 850,511
Claims priority, application Japan, Sept. 6, 1968, 43/63721
Int. Cl. B05c *3/134, 3/136*
U.S. Cl. 68—53 **1 Claim**



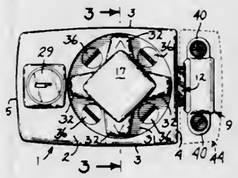
A device for continuously treating a textile fabric, comprising a tank containing liquid therein, an arcuately curved, concave false bottom provided in said tank, a rotary frame pivotally mounted in said tank above said false bottom and having a curvature corresponding to that of said false bottom, means for alternately rotating said rotary frame in forward and backward directions like a pendulum, said rotary frame being provided on its peripheral surface with a plurality of partitioning plates each lying in a radial plane of said rotary frame to divide said peripheral surface into sections and a plurality of resistance plates each lying in an axial plane of said rotary frame to produce turbulent flow in the liquid above said false bottom during operation, whereby the textile fabric is successively passed through the respective sections and is subjected to breaking action by the turbulent flow of the liquid between the rotary frame and the false bottom.

3,580,016
KEEPER LOCK FOR A SLIDE FASTENER
William J. Kerr, Glenview, Ill., assignor to Chicago Lock Co., Chicago, Ill.
Filed Apr. 15, 1970, Ser. No. 28,656
Int. Cl. E05b *67/38, 11/06;* **A44b** *19/00*
U.S. Cl. 70—68 **10 Claims**



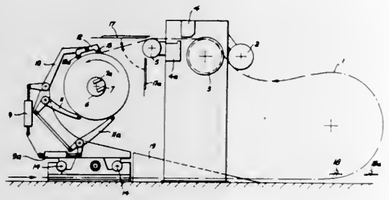
A concentric three-part, key-operated keeper lock for a slide fastener and including an outer lock barrel having a radial anvil portion which underlies the pull tab of the slide fastener when the fastener is in its closed position, an intermediate telescopically movable rotatable handle having a radial keeper flange which is adapted to overlie the pull tab when the barrel and handle are telescoped together, and an inner tumbler-type cylinder having a locking bolt which maintains the barrel and handle telescoped. In the telescoped position of the handle and barrel, interlocking shoulders prevent rotation of the handle. In the unlocked condition of the cylinder, the handle may be moved axially to free the interlocking shoulders, after which the handle may be rotated throughout a 90° arc in order to withdraw the keeper flange from its tab-overlying position. The keeper lock is self-locking in that when it is in its unlocked condition it may be manipulated to a locked condition without the use of the proper key.

3,580,017
LOCK WITH MEANS CONCEALING MOUNTING FASTENERS
Russell W. Waldo, St. Paul, Minn., assignor to Ideal Security Hardware Corporation, St. Paul, Minn.
Filed Nov. 5, 1969, Ser. No. 874,277
Int. Cl. E05b *9/08, 15/02*
U.S. Cl. 70—81 **10 Claims**



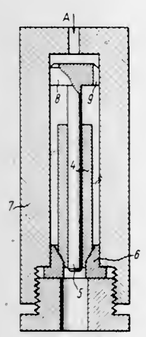
A deadlock including a bolt housing and a cooperating strike element each having openings for reception of fastening means for anchoring the same one to a door and the other to a door frame. A bolt-operating knob on the housing conceals the fastening means when the bolt is in both its extended strike-engaging and retracted strike-releasing positions, the fastening means being exposed only when the bolt is moved to an intermediate position between its fully extended and retracted positions. A cover is press fitted on the strike to conceal the fastening means thereon.

3,580,018
MACHINE FOR COILING ELONGATED STRIPLIKE MATERIAL
Hans Gott, Graz, and Josef Ritter, Graz-Krotsbach, Austria, assignors to EVG Entwicklungs und Verwertungs-Gesellschaft m.b. H, Graz, Austria
Filed June 13, 1968, Ser. No. 736,852
Claims priority, application Austria, June 16, 1967, A5638/67
Int. Cl. B21b *37/00*; **B21c** *47/00*; **B21d** *45/00*
U.S. Cl. 72—12 **10 Claims**



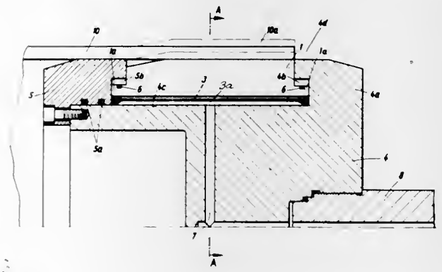
A machine for coiling elongated striplike material such as welded mesh reinforcement of the kind in which the material is coiled on a mandrel from which the completed coil is removed after the coil and mandrel have been separated by axial movement relative to each other is provided with a gripper mechanism for gripping the coil and this mechanism is arranged to travel between a first position near the mandrel and a second position away from the mandrel. The gripper mechanism has at least two grippers capable of pivoting inwards from opposite sides into contact with the outer surface of a coil mounted on the mandrel so that they thrust against the surface of the coil and hold it together. The gripper mechanism is arranged so that during its movement from the first position into the second position, the grippers continue to hold the coil firmly together and prevent it from uncoiling.

3,580,019
METHOD OF MANUFACTURING ROD, SHAPED AND TUBULAR PRODUCTS FROM DIFFICULT-TO-WORK METALS AND ALLOYS, PREFERABLY HIGH MELTING-POINT AND CHEMICALLY ACTIVE ONES
Boris Ivanovich Beresnev, Krasnoprudnaya 7/9, kv.31; Evgeny Dmitrievich Martynov, MGU sektor 1, kv. 13; Jury Nikolaevich Ryabinin, Vorobievskoe shosse 2, kv. 40; Mikhail Vasilievich Maltsev, ul Streletskaya 26-a kv. 40; Georgy Pavlovich Britnev, ul Lobachika 10, kv. 4; Anatoly Vasilievich Kocherov, 3 Pavlovsky per., 13, kv. 2, Moscow; Dmitry Konstantinovich Bulychev, ul Kuibysheva,123-B, kv. 24, Sverdlovsk, and Kuzma Petrovich Bodionov, ul Malysheva 135, Kv. 1, Sverdlovsk U.S.S.R.
Filed May 10, 1967, Ser. No. 637,450
Int. Cl. B21c *23/24*
U.S. Cl. 72—47 **7 Claims**



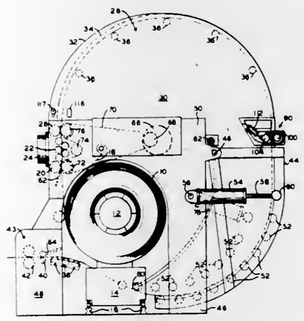
A method of extruding materials that are difficult to extrude in which a blank of the material is enclosed in a container with a portion extending into an extrusion die and the blank is subjected to high pressure fluid to press the blank through the blank may be coated with a metal or metals such as nickel and copper, and a a lubricant applied thereto. The outer coating of a blank coated with plural layers of metal may be porous.

3,580,020
APPARATUS FOR CALIBRATING PIPES
Ali Bindernagel, Dusseldorf-Gerresheim; Erwin Kost, Osterath, and Karl-Hans Staat, Homberg Bie Ratingen, Germany, assignors to Firma Friedrich Kocks, Dusseldorf, Germany
Filed Aug. 23, 1968, Ser. No. 754,759
Claims priority, application Germany, Sept. 1, 1967, P 16 02 289.2
Int. Cl. B21d *39/08*
U.S. Cl. 72—58 **11 Claims**



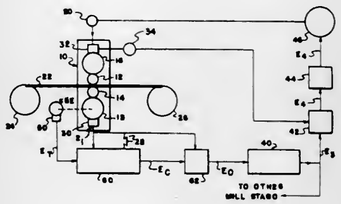
Apparatus for calibrating pipes by expansion or swaging, comprises a housing holding an annular deforming tool consisting of a number of axially extending segments which are arranged side-by-side to form a cylinder and which are movable radially outwards or inwards, this radial movement being limited by stops which engage the ends of the segments, and a cylindrical sleeve which bears on either the inner or the outer faces of the segments and which forms a pressuretight chamber between itself and the housing, so that, in use, when the chamber is supplied with fluid under pressure the sleeve is forced radially outwards or inwards, hence forcing the segments radially outwards or inwards into engagement with the inside or outside of a pipe until further radial movement is prevented by the stops, at which time the pipe is expanded or swaged to an exact size determined by the apparatus.

3,580,021
STRIP STOCK HANDLING EQUIPMENT
Donald L. Cramer, and Paul D. Limpach, Napoleon, Ohio, assignors to Automatic Feed Company, Napoleon, Ohio
Filed July 24, 1968, Ser. No. 747,309
Int. Cl. B21d *55/00*
U.S. Cl. 72—5 **8 Claims**



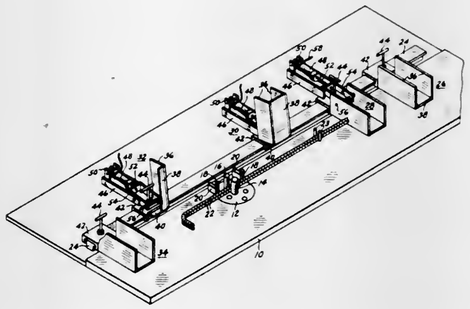
Equipment for uncoiling and conditioning strip stock to be utilized in devices such as punch presses, shears, and stamping machines.

3,580,022
ROLLING MILL INCLUDING GAUGE CONTROL
Marion D. Waltz, and Lewis A. Drake, Youngstown, Ohio, assignors to The Youngstown Sheet and Tube Company, Mahoning County, Ohio
Filed Nov. 12, 1968, Ser. No. 774,775
Int. Cl. B21b *37/08*
U.S. Cl. 72—8 **10 Claims**



In combination with a rolling mill and control means for controlling the spacing between a set of work rolls therof the method and means for producing an electrical control signal for said control means which is free of a component which varies cyclically with the rotation of the rolls, e.g., the eccentricity of the rolls.

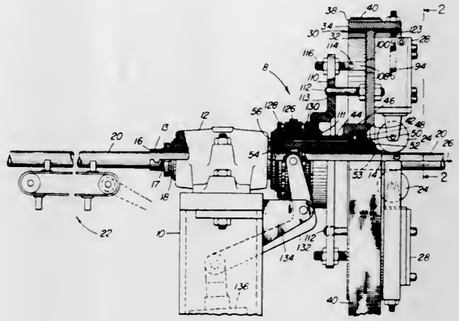
3,580,023
AUTOMATED STOPS FOR BAR BENDING MACHINE
Neal W. Merrill, Bethlehem, and Charles R. Nippert, Allentown, Pa., assignors to Bethlehem Steel Corporation
Filed Dec. 9, 1968, Ser. No. 782,197
Int. Cl. B21j *7/26*
U.S. Cl. 72—22 **2 Claims**



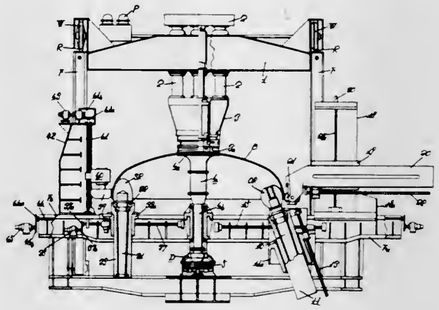
A bar bending machine comprising a rotatable bending disc having a central pin and a bending pin is provided with a plurality of stops for positioning a bar longitudinally prior to the actuation of said disc. The machine is programmed whereby said disc sequentially rotates through predetermined angles, bending the bar a plurality of times, each rotation being controlled by a switch. The stops are connected to a circuit whereby the proper stop is sequentially moved into and out of the path of the bar during the bending operation.

3,580,024
METHOD AND APPARATUS FOR CORRUGATING TUBES
Howard F. Mattil, Yonkers, N.Y., assignor to Phelps Dodge Copper Products Corporation, New York, N.Y.
Filed Nov. 27, 1968, Ser. No. 779,456
Int. Cl. B21d *13/04*
U.S. Cl. 72—77 **15 Claims**

This invention comprises a tube corrugating method and apparatus in which a forming tool is selectively engaged forcefully with and disengaged from the tube while the tube advances axially past the tool. The tube may be pressurized internally with a fluid to improve corrugation shape.



3,580,025
END PLATE FORMING APPARATUS
Yasutoshi Hayashi, No. 2, 5-Chome Senbon-dori Nishinari-ku, Osaka, Japan
Filed Dec. 17, 1968, Ser. No. 784,358
Claims priority, application Japan, Aug. 24, 1969, 43/60584
Int. Cl. B21h *1/00*
U.S. Cl. 72—84 **6 Claims**

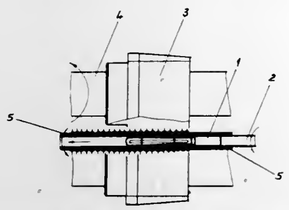


End plate forming apparatus comprising an upper support member and a lower support member provided on the same axis to hold therebetween and revolve a blank and a plurality of sets of forming rollers to be moved on the same locus as the curved surface of the required end plate to form the required end plate by cooperative working.

3,580,026
METHOD AND APPARATUS FOR MANUFACTURING FINNED PIPES
Ioan Luca, Bucharest, Romania, assignor to Institutul De Cercetari Tehnologice Pentru Constructii De Masini Soseaua Oltenitei, Bucharest, Romania
Filed Dec. 17, 1968, Ser. No. 786,824
Int. Cl. B21d *19/08*
U.S. Cl. 72—96 **8 Claims**

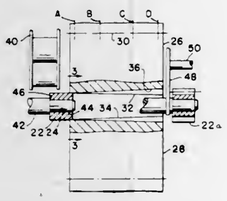
Cooling fins are rolled onto the outer surface of a pipe or tube, while simultaneously the cross section of the pipe or tube is changed to an oval or elliptical shape. The inner sur-

face of the pipe or tube may be either smooth or provided with grooves. The fins are formed by three rotating dies, and



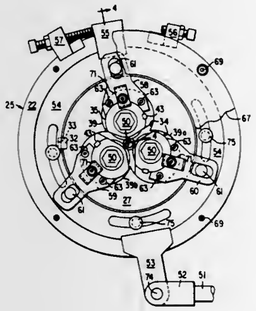
the cross-sectional shape and inner surface is formed by drawing the pipe or tube over a rotating mandrel.

3,580,027
GEAR ROLLING
David W. Daniel, Birmingham, and Warren C. McNabb, Detroit, Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.
Filed Dec. 2, 1968, Ser. No. 780,390
Int. Cl. B21h *5/02*
U.S. Cl. 72—98 **14 Claims**



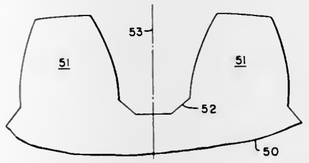
Method and apparatus for producing gears from circular blanks by rolling them in metal deforming pressure contact with one or more toothed dies. The configuration of the space between the teeth of the die or dies is carefully controlled so as to provide surfaces which prevent the formation of "rabbit ears" and which accordingly eliminates the "cold shut" previously located at the crests of the teeth of gears rolled from circular blanks.

3,580,028
APPARATUS FOR PRODUCING EXTERNAL INTEGRAL FINS FOR TUBING
Frank F. Walters, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Mar. 3, 1968, Ser. No. 803,895
Int. Cl. B21h *3/12*
U.S. Cl. 72—98 **4 Claims**



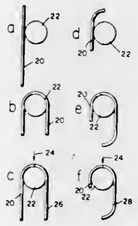
An improvement in apparatus for forming axially spaced integral helical fins on a length of tubing, the apparatus including a body member mounted within and interconnected to an outer housing which defines the outer surface of a tube finning head assembly. Journaled within the body member are a plurality of crescent-shaped cams which operate a plurality of forming roll assemblies including tool support arbors. Supported on the arbors are a plurality of die means which define axially-spaced peripheral portions with grooves formed therebetween. The body member is made of heat-hardened steel, thereby increasing its wear resistance. The body member may be easily disengaged from the housing thereby expediting and reducing the cost of certain repairs.

3,580,029
ROLLING CHAMFERS ON GEAR TEETH
David W. Daniel, Birmingham; Henry O. Verschaeve, St. Clair Shores, and Warren C. McNabb, Detroit, Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.
Filed Dec. 5, 1968, Ser. No. 781,420
Int. Cl. B21h *5/00*
U.S. Cl. 72—108 **7 Claims**



Gear rolling dies are provided with inclined chamfer-forming ramp surfaces at the bottoms of the tooth spaces adapted to form chamfers at the tops of the gear teeth along the corners defined by the intersection of the crests of the teeth and the flank surfaces.

3,580,030
COIL FORMER
Dennis P. Bean, and John C. Parks, Los Angeles, Calif., assignors to Solatron Enterprises, Los Angeles, Calif.
Filed Nov. 15, 1968, Ser. No. 776,034
Int. Cl. B21f *37/00*
U.S. Cl. 72—130 **12 Claims**

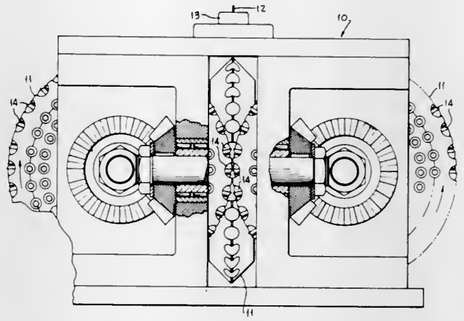


A method of making single-turn, planar, circular coils is disclosed in which a substantially linear rodlike element is cut and bent into a circle of predetermined radius through successive bending and cutting steps. The circular ring is formed from an element which has been precut in the shape of an elongated "C" which has, at each of its ends, a 90° bend to a radius of curvature substantially equal to the predetermined radius.

3,580,031
MANUFACTURING APPARATUS
Vincent J. Donadio, Pompton Plains, and Olavi F. Anderson, Succasunna, N.J., assignors to The United States of America as represented by the Secretary of the Army
Filed June 20, 1969, Ser. No. 835,045
Int. Cl. B21d *13/10*
U.S. Cl. 72—186 **4 Claims**

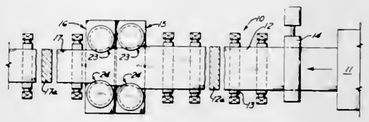
A machine for manufacturing flechettes at substantially higher rates of production and operating efficiency. The

machine has a plurality of rotatable wheels each having a plurality of peripherally spaced eccentric bushings. Each bushing has a central axis that extends radially of its wheel and perpendicularly of a peripheral centerline of the wheel. Each bushing contains a die insert and is mounted for transverse adjustment of the bushing central axis relative to the



corresponding wheel centerline. Each die insert has a fin-forming portion and a nose-forming portion that cooperate to provide a positive means of feeding a workpiece through the machine. Each wheel has a main body-forming portion intermediate the fin-forming portion of each die and the nose-forming portion of the following adjacent die.

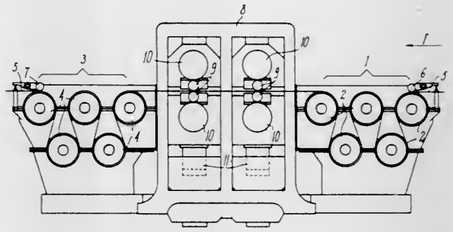
3,580,032
APPARATUS FOR REDUCING THE WIDTH OF METALLIC SLABS
Morris Denor Stone, and Howard Hubbell Talbot, Pittsburgh, Pa., assignors to United Engineering and Foundry Company
Filed Apr. 17, 1969, Ser. No. 817,133
Int. Cl. B21b *15/00, 31/16*
U.S. Cl. 72—199 **8 Claims**



Disclosed are two embodiments of apparatuses for performing work on metallic slabs to substantially reduce their width. In the first embodiment there is provided a pair of driven slab reducing rolls, each rotatably supported in a housing. The rolls are adjustably positioned relative to each other to reduce the slabs to a desired width. Concentrically carried on each roll are a pair of spaced anvil collars, one of which is adjustably positionable relative to the other to accommodate slabs of different thicknesses. In the second embodiment there is provided a pair of adjustably positionable slab squeezer heads, one of which is reciprocated relative to the other. Pairs of platens adjustably support and locate the slab in a direction normal to the movement of the reciprocating squeezer head.

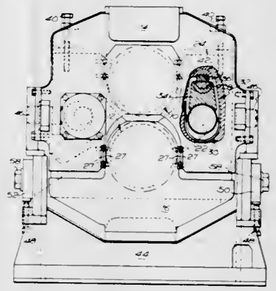
3,580,033
ROLLING MILL FOR PRODUCING THIN STRIP STOCK
Pierre Gay, La Tour en Jarez, France, assignor to Compagnie Des Ateliers Et Forges De La Loire (St. Chamond, Firminy, St. Etienne, Jacob-Holtzer), Paris, France
Filed Feb. 14, 1969, Ser. No. 799,228
Claims priority, application France, Feb. 16, 1968, 1218176
Int. Cl. B21b *39/08, 35/00*
U.S. Cl. 72—205 **11 Claims**

Rolling mill for producing thin strip stock which comprises: a first tension unit acting as a retaining unit, a second tension unit acting as a driving unit, said first and second units comprising each a number of rolls driven at a same peripheral velocity from driving means, said strip to be rolled being passed over said rolls; coupling means arranged between said first and second units and adapted to impart a constant and possibly adjustable value to the ratio of the tangential speeds of said rolls of said first and second units,



means for driving with an adjustable torque the combined mechanism consisting of said first and second tension units, and a four-high stand disposed between said units and provided with work rolls of relatively small diameter rotatably driven by frictional engagement from positively driven supporting rolls.

3,580,034
ROLLING MILLS
Alexander Ian Wilson, Sheffield, England, assignor to The Hille Engineering Company Limited, Sheffield, England
Filed July 30, 1968, Ser. No. 748,716
Int. Cl. B21b *31/00*
U.S. Cl. 72—237 **10 Claims**

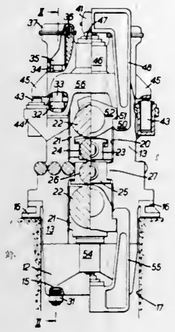


A rolling mill has adjacent roll chocks connected together by a pair of pins extending parallel to the axes of the rolls.

3,580,035
ROLLING MILLS
Harry Laurence Fred Bond, Hathersage; Dennis Stubbs, and Maltby Todwick, Sheffield, all of, England, assignors to Davy and United Engineering Company, Limited, Yorkshire, England
Filed Apr. 5, 1968, Ser. No. 719,135
Int. Cl. B21b *31/16*
U.S. Cl. 72—243 **8 Claims**

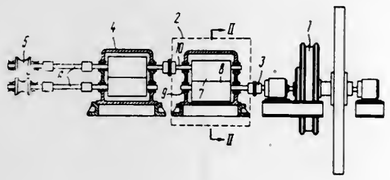
A rolling mill stand has two pairs of housing posts, the members of each pair defining a space therebetween for receiving one above the other the chocks for at least two rolls, a separate housing top overlying all four members and which is adjustably displaceable vertically relative to the posts, the top having a pair of parts extending sideways beyond the planes through the pairs of housing posts and means carried by the extended parts for bending the roll supported by the uppermost chock in each of said spaces. The base of the housing posts also has a pair of parts extending

sideways beyond the planes through the pairs of housing posts and means carried by the pair of extended parts for



bending the roll supported by the lowermost chock in each of the spaces.

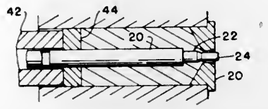
3,580,036
METHOD OF ROLLING ON A PILGER MILL
Iosif Luouich Zayats, Moskovskoi oblasti ulitsa Zhulyabina,3,kv.99, Moskovskoi oblasti ulitsa Zhulyabina,3,kv.99; Vladimir Pavlovich Barabashkin, Moskovskoi oblasti, ulitsa Noginsky proezd,30,kv.21, Elektrostal; Boris Nikolaevich Matveev, Balaklavsky prospekt,24,Korpus 2,kv,157, and Jury Fedorovich Shevakin, Telegrafny pereulok,11/11,kv,53, Moscow, U.S.S.R.
Filed Oct. 15, 1968, Ser. No. 767,678
Int. Cl. B21b *35/00*
U.S. Cl. 72—249 **11 Claims**



A method of pilger rolling is disclosed which employs a pilger mill which comprises spaced die rolls mounted for continuous rotation about fixed axes. The feeding and rolling are effected intermittently step by step. A step of feeding of the successive portion of a blank into the gap between rolls and the next step of rolling this portion are effected during one revolution of the rolls. The directions of blank movement are opposite in feeding and rolling. A device is provided between the drive motor and the rolls to convert the uniform rotation of the drive motor into a periodically varying rotation of rolls. Thus the rotary speed of the rolls is varied periodically within each revolution so that the rate of speed during feeding is lower than that when the feeding is arrested and the successive portion of blank is rolled. Several different forms of device are provided, such as an elliptical gear train, multilink and slide block mechanisms.

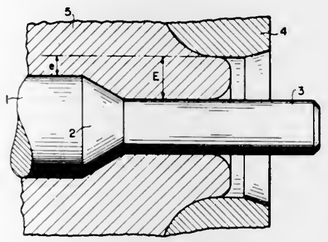
3,580,037
TUBE EXTRUSION APPARATUS INCLUDING SEPARABLE ARRESTED MANDREL TIP TUBE CUTOFF
John W. Issott, Dearborn, Mich.; Harold E. Honkala, and Delbert V. Carraher, Decatur, Ala., assignors to Universal Oil Products Company, Des Plaines, Ill.
Filed Oct. 7, 1968, Ser. No. 765,406
Int. Cl. B21c *23/00*
U.S. Cl. 72—255 **7 Claims**

Tube extrusion apparatus employing an arrested mandrel having a separable tip including axially spaced extrusion and cutoff portions. The mandrel tip is substantially smaller than the main mandrel which supports the tip during billet piercing operation resulting in back extrusion of the billet materi-



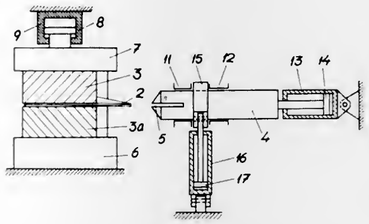
al. The mandrel is stationary during the extrusion operation and at the completion advances slightly to introduce the tube cutoff portion of the mandrel tip into the extrusion die.

3,580,038
EXTRUSION MANDREL AND METHOD
Jean-Michel Andreassian, Parmain, France, assignor to Compagnie Du Filage Des Metaux Et Des Joints Curty, Paris, France
Filed Apr. 3, 1968, Ser. No. 718,416
Int. Cl. B21c *23/04, 25/00;* **B21b** *17/02*
U.S. Cl. 72—264 **5 Claims**



An improvement in an extrusion mandrel in combination with the cylindrical part of the mandrel that defines the interior contour of the extruded workpieces which includes a short front member of generally cylindrical configuration but having a cross-sectional diameter and a length less than the cylindrical part and a base member joining the front member to the cylindrical part. In use, the mandrel is positioned so that the short front member always cooperates with the die at the beginning of the extrusion.

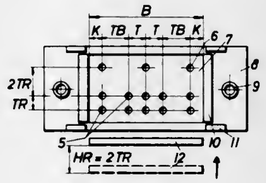
3,580,039
DEVICE FOR MANUFACTURING BLADES FOR THE BLADE WHEEL OF AN AXIAL FLOW MACHINE
Martti Heinonen, Turku, Finland, assignor to Valmet Oy, Helsinki, Finland
Filed June 20, 1968, Ser. No. 738,547
Claims priority, application Finland, June 21, 1967, 1753/67
Int. Cl. B21d *41/02*
U.S. Cl. 72—316 **5 Claims**



Blades which are to be attached to the blade wheel of an axial flow machine, have a paddle part and an attachment surface which are simultaneously shaped in two molds. One of these molds shapes the paddle part in the desired manner

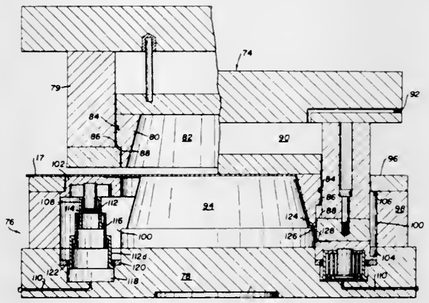
while the other mold imparts the final shape to the attachment surface. Then the two molds with the blade still clamped in them are twisted to produce the desired blade angle.

3,580,040
PROCESS AND TOOL FOR FORMING HOLES IN PROFILED MEMBERS WITH A PREDETERMINED SPACING
Gunther Lang, Triesterstrasse 388, Graz-Puntigam, Steuermark, Austria
Filed Oct. 30, 1968, Ser. No. 771,805
Claims priority, application Austria, Oct. 30, 1967, 9764/67
Int. Cl. B21d *43/28;* **B21c** *37/02;* **B26d** *1/00*
U.S. Cl. 72—324 **7 Claims**



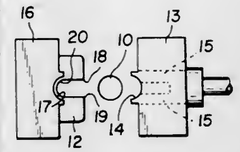
A process is disclosed for providing holes with particular spacing in profiled metal sheets, preferably of steel, wherein the shaping of the sheets follows the formation of the holes in the sheet. The invention contemplates cutting the perforations in the sheet while it is flat and prior to its shaping, such that the spacing between the holes in the longitudinal direction of the sheet is less than the standard spacing to be provided in the shaped member to compensate for the elongation of the sheet in the longitudinal direction during the shaping of the sheet. A tool for punching the holes includes insert members which are adjustable for regulating the reduced spacing of the holes to be punched in the sheet.

3,580,041
DIE ASSEMBLY
Lorenz Tilly, Montreal, and Barrie Bonner, Westmount, Quebec, Canada, assignors to Universal Alufolien Verfahren A.G., Zug, Switzerland
Filed Feb. 5, 1968, Ser. No. 702,901
Int. Cl. B21d *22/22*
U.S. Cl. 72—336 **12 Claims**



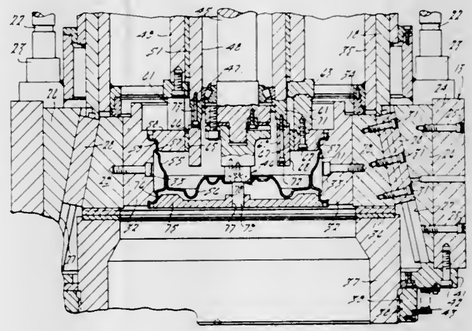
A method and apparatus for forming sheet material, such as light gauge foil, into containers and the like. A punch and die arrangement includes supporting the forming portions of the die assembly by a pressurized fluid such as air so that these portions yieldably conform with precision to the punch surfaces during a forming operation.

3,580,042
WIRE GROOVING METHOD AND MACHINE
David W. Snyder, Hilton, N.Y., assignor to Snyder Specialty, Inc., Hilton, N.Y.
Filed Nov. 12, 1968, Ser. No. 774,751
Int. Cl. B21d *28/00, 31/00;* **B21c** *3/02*
U.S. Cl. 72—339 **8 Claims**



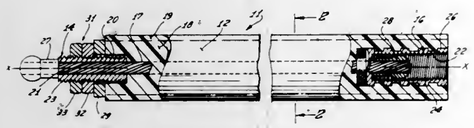
Wire stock is given an encircling, coaxial groove by shearing off a pair of slugs of material along equal and parallel chord planes on opposite sides of the wire axis, and pressing the remaining core of material in the direction of the chord planes first from one side and then the other to form the cylindrical surfaces of the groove. The shearing tool preferably includes a semicylindrical, concave die for forming half the groove surface in the shearing stroke, and a die with a slightly larger diameter semicylindrical surface presses from the opposite direction to complete the groove.

3,580,043
WHEEL ROUNDING MACHINE
George E. Gollwitzer, Belleville, Mich., assignor to Kelsey-Hayes Company
Filed Oct. 22, 1968, Ser. No. 769,625
Int. Cl. B21d *41/00*
U.S. Cl. 72—402 **7 Claims**



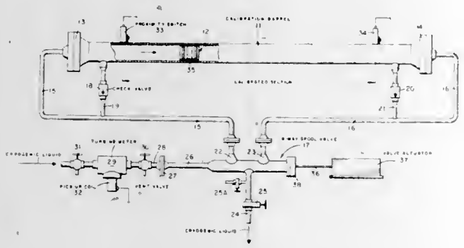
A machine for rounding assembled wheels and for accurately forming and aligning a locating hole in the wheel spider with relation to the rim. The machine includes a plurality of radially movable rounding dies for engagement with the rim of the assembled wheel for rounding the rim. In addition, a forming tool in the form of a rotating cutter is provided for forming and aligning a locating opening in the wheel spider. The forming tool is supported by aligning means that are engageable with the inner periphery of the rim of the wheel when the rounding dies are in their rounding position for accurately aligning the forming tool with respect to the rounded rim. The aligning means comprises a floating backup ring to assist in the wheel rounding operation.

3,580,044
TUBE BENDING MANDREL
Edwin A. De Voss, 2550 Pacific Coast Highway, Torrance, Calif., and Antone M. Guerreiro, 3730 W. 132nd St., Hawthorne, Calif.
Filed Mar. 24, 1969, Ser. No. 809,713
Int. Cl. B21d *9/01*
U.S. Cl. 72—466 **3 Claims**



A mandrel useful in tube bending operations, the mandrel being constructed—for the most part of plastic or like materials—and includes means whereby the mandrel may be reshaped insuring smooth continuous bends therein free of wrinkles corrugations and the like.

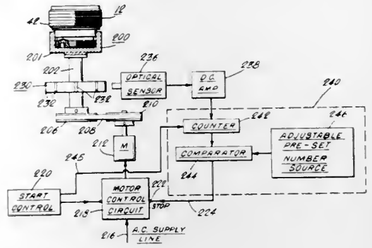
3,580,045
METER PROVER
Raymond H. Pfrehm, Houston, Tex., assignor to Esso Research and Engineering Company
Filed July 16, 1968, Ser. No. 745,256
Int. Cl. G01f *25/00*
U.S. Cl. 73—3 **15 Claims**



A bidirectional meter prover adapted to be connected to a conduit having a meter arranged therein is provided with a valve means connected to the calibration barrel of the meter prover and to the meter such that the valve means is rapidly shifted for movement of the piston in the meter prover in either direction in the calibration barrel for proving the meter. The meter prover is adapted for proving meters used for metering cryogenic liquids with the cryogenic liquid being introduced into the meter proving system and with the cryogenic liquid being vented as the system is cooled to equilibrium temperature; venting is stopped while introduction of cryogenic liquid is continued until thermal equilibrium is reached. Thereafter, the system is operated to prove the meter at equilibrium temperature.

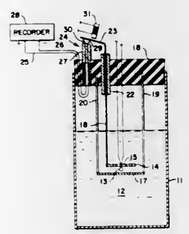
3,580,046
METHOD AND APPARATUS FOR TESTING ROTATION-RESPONSIVE DELAY DEVICES
Oliver F. Cheney, Philadelphia, Pa., assignor to Delaware Valley Armaments, Inc., Mt. Laurel Twp., N.J.
Filed June 13, 1969, Ser. No. 833,007
Int. Cl. F42c *21/00*
U.S. Cl. 73—5 **8 Claims**

Arming delay-devices, suitable for delaying the arming of an artillery shell until it is well away from the gun by which it is fired, are tested in production by rotating each of them in a



test stand and determining the number of turns of the device required for it to become armed.

3,580,047
POUR AND CLOUD POINT ANALYZER
Samuel W. Simpson, Florissant, Mo., assignor to Shell Oil Company, New York, N.Y.
Filed Nov. 24, 1967, Ser. No. 685,587
Int. Cl. G01n *25/02*
U.S. Cl. 73—17 **6 Claims**

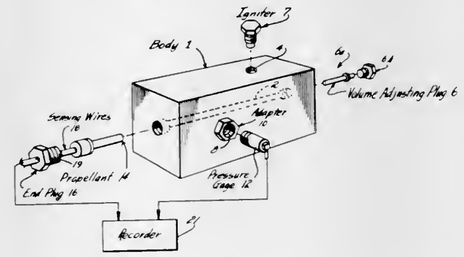


Apparatus for determining the pour point of an oil sample by observing the temperature at which the solidified constituents in the oil sample, upon being heated, will no longer support a small object. This point is indicated by discontinuance in an automatically recorded time/temperature curve during the warning portion of the cycle. The inception point of a plateau in the time/temperature curve during the cooling portion of the cycle is the crystal point. This crystal point correlates with the ASTM cloud point. Modification of the apparatus for continuous service can be accomplished by automatically introducing the sample, then cooling, heating, removing the sample and recirculating a fresh sample.

3,580,048
SIMULATOR FOR SIMULATING THE ACTION OF THE PRESSURE OF A SHOCK WAVE OF A NUCLEAR EXPLOSION
Walter Trinks, Bad Honnef; Theodor Karl Netzer, Pocking-Starnberg; Hans T. Victora, Bliesheim bei Lechenich; Hermann Saurer, and Heinrich Von Paulgerg, Bonn, Germany, assignors to Berliner Mashinenbau A Gvorm. L. Schwartzkopff, Bonn-Tannenbusch, Germany
Filed Feb. 21, 1967, Ser. No. 617,619
Int. Cl. G01m *7/00*
U.S. Cl. 73—35 **15 Claims**

A simulator to simulate the effects of a nuclear explosion and wherein the simulator is adapted to be placed on the object to be tested. The simulator includes an outer housing in which is situated a thrust-producing means for producing a thrust having the nature of a rocket thrust, and a transfer means is carried by the housing for transferring from the latter the reaction of the thrust to the object to be tested. The housing has an opening through which a fluid discharges during action of the thrust-producing means, and this thrust-producing means may take the form of a body of water situated in the housing and acted upon by air under pressure. A burstable membrane closes the discharge opening of the housing, and an explosive is provided for bursting the membrane or diaphragm so as to release the pressure in the housing, the water being discharged therefrom by the air under pressure so as to provide a thrust which can be transmitted to the object to be tested for simulating the action of a nuclear explosion.

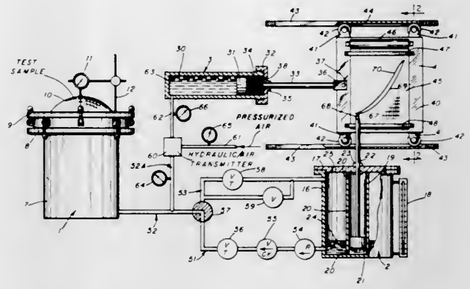
3,580,049
ROCKET BURN RATE TESTING DEVICE
Lonnie D. Cardwell, Irving; Fred T. Esenwein, and Arthur E. Pierard, Arlington, Tex., assignors to The United States of America as represented by the Secretary of the Navy
Filed July 25, 1968, Ser. No. 750,426
Int. Cl. G01n *33/22*
U.S. Cl. 73—35 **1 Claim**



A closed chamber designed to hold one or more strands of a solid propellant is equipped with igniting means, pressure indicating means, and burning rate indicating means. The apparatus avoids the problems inherent in static burning rate tests using an inert pressurizing gas.

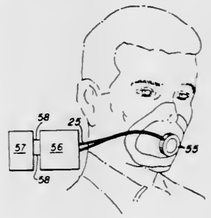
3,580,050
TESTING DEVICE FOR STRETCHABLE SHEET MATERIALS UNDER SIMULTANEOUS DISTORTION IN THREE DIMENSIONS
Paul H. R. Waldron, 175 Jupiter Point Road, Groton, Conn.
Filed May 19, 1969, Ser. No. 825,856
Int. Cl. G01m *3/02*
U.S. Cl. 73—37 **13 Claims**

Apparatus for testing stretch, recovery and hysteresis characteristics of fabrics particularly useful for elastic fabrics of type used in foundation garments and brassieres, including multidirectionally stretchable isotropic or nonisotropic fabrics. Test sample is secured against an elastomeric diaphragm which is progressively inflated to distort sample in three dimensions while measuring volumetric change in relation to force applied. Device also plots relationship of force to dimension change in sample in any desired direction or directions. Both volumetric and dimensional changes are also plotted to show recovery characteristics of fabric during deflation of diaphragm. Repeated tests on same sample show hysteresis characteristics thereof. Device also useful with



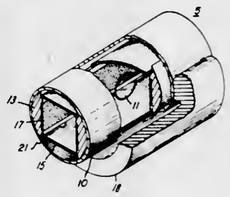
paper, felts or other sheet material to test stretch and/or bagging and/or bursting characteristics.

3,580,051
METHOD FOR LEAK TESTING MASKS
William V. Blevins, Joppa, Md., assignor to the United States of America as represented by the Secretary of the Army
Division of Ser. No. 662,209, Aug. 21, 1967. Pat. No. 3,504,542. application Oct. 3, 1969, Ser. No. 871,119
Int. Cl. G01m *3/26*
U.S. Cl. 73—40 **1 Claim**



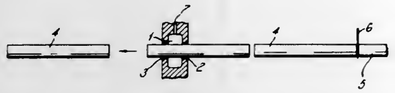
A method for leak testing masks by hermetically sealing a flowmeter at the mouth area of the mask undergoing test and monitoring leakage due to external pressure during mask wearer's breathing function.

3,580,052
DISCHARGE GAGE FOR HELIUM LEAK DETECTOR USE
James Roger Young, Rexford, N.Y., assignor to General Electric Company
Filed Oct. 23, 1969, Ser. No. 868,877
Int. Cl. G01m *3/04*
U.S. Cl. 73—40.7 **6 Claims**



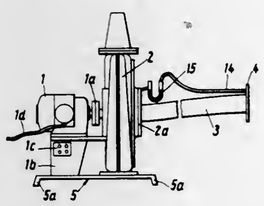
A Penning-type discharge gage for a leak detector using a mass spectrometer and helium as a probe gas uses graphite cathodes to eliminate the helium memory associated with cathodes consisting of other materials.

3,580,053
CIGARETTES TESTING
Desmond Walter Molins, Deptford, London, England, assignor to Molins Machine Company Limited, London, England
Filed Oct. 7, 1968, Ser. No. 765,374
Claims priority, application Great Britain, Oct. 11, 1967, 46375/67
Int. Cl. G01m *3/04*
U.S. Cl. 73—41 **4 Claims**



Testing cigarettes for leaks by passing them endwise through a suction chamber which draws air from atmosphere through the end of a cigarette and through its wrapping and the pressure of which fluctuates according to the air flow.

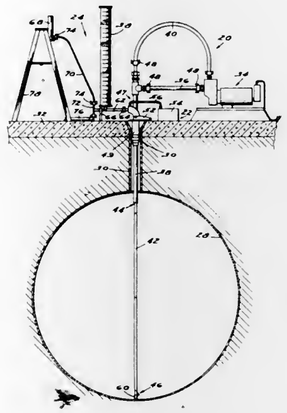
3,580,054
APPARATUS FOR DETECTING LEAKS IN HOLLOW BODIES
Hermann Schlumbaum, Wennigsen, Deister, Germany, assignor to Stephan-Werke GMBH & Co., Hamelor/Weser, Germany
Filed Oct. 4, 1968, Ser. No. 765,078
Claims priority, application Germany, Oct. 5, 1967, P 16 48 736.8
Int. Cl. G01m *3/26*
U.S. Cl. 73—49.2 **7 Claims**



Apparatus for detecting the presence or absence of leaks in bodies of automotive vehicles comprises a frame which supports an electric motor serving to drive a suction generating device whose inlet is connected with a suction conduit. The latter can be placed against the opening of an automobile body to evacuate air, and a gauge, U-tube or analogous measuring device is provided to determine the pressure in the opening and/or in the suction conduit to thereby indicate the presence or absence of leaks. The frame may be provided with legs and/or wheels so that it can be readily transported between storage and one or more locales of use. The frame is further provided with means for storing the suction conduit, for storing the conductor which supplies current to the motor, and/or for storing nozzles one of which can be coupled to the intake end of the suction conduit for insertion into or for placing against an opening.

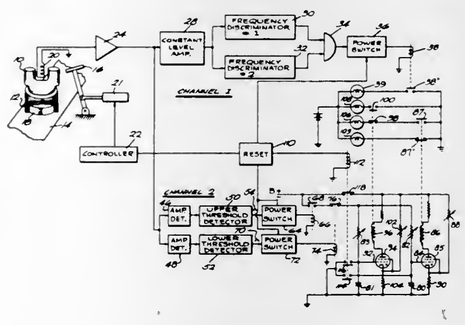
3,580,055
TANK SYSTEM TIGHTNESS TESTER
Richard B. White, Orchard Lake, Mich., assignor to Kent-Moore Corporation, Warren, Mich.
Filed Oct. 25, 1968, Ser. No. 770,763
Int. Cl. G01m *3/26*
U.S. Cl. 73—49.2 **15 Claims**

This disclosure relates to a test apparatus for measuring the tightness of tanks, such as underground fuel storage tanks, and a method of performing the test. The apparatus includes a temperature sensing device adapted to measure the temperature of the fluid within the tank, a means to establish a fluid head in communication with the fluid in the tank to measure the change in volume of fluid in the system during the test period, and a fluid circulating system which continuously circulates fluid from the tank and back to equalize the temperature of the fluid in the tank, and permit accurate



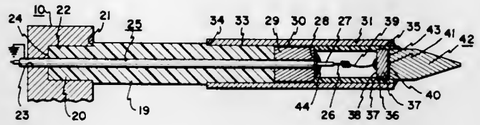
compensation for temperature variations in the system. In the disclosed embodiment, a means is provided to adjust the height of the fluid head to stabilize the deflection of the walls of the tank.

3,580,056
NONDESTRUCTIVE, RESONANT TESTING APPARATUS WITH MAGNETIC PICKUP
Robert F. Warner, Coldwater, Mich., assignor to Hayes Albion Corporation, Jackson, Mich.
Filed Oct. 12, 1967, Ser. No. 674,798
Int. Cl. G01h *13/00*
U.S. Cl. 73—67.2 **3 Claims**



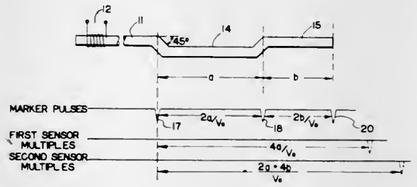
A casting under test is placed in a magnetic field and struck with a hammer causing the casting to vibrate at its resonant frequency. There is a pickup coil disposed in the field to sense variations thereof caused by vibration of the casting. The pickup coil develops a test signal whose frequency and amplitude represent the vibration of a casting. The test signal is processed via a frequency discrimination circuit and a decay rate detection circuit to ascertain when the vibration frequency and the vibration decay rate are acceptable.

3,580,057
PROBE DEVICE USABLE IN MEASURING STRESS
Ben L. Seegmiller, Salt Lake City, Utah, assignor to The University of Utah, Salt Lake City, Utah
Filed June 19, 1969, Ser. No. 834,834
Int. Cl. G01n *29/00*
U.S. Cl. 73—67.6 **2 Claims**



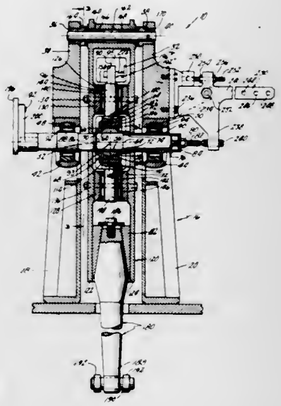
A probe device for use with stress-measuring apparatus and having plural probes provided with mutually and, in one form of the invention, variably spaced tips. These tips preferably comprise parallel, chisel-contact tips. Transducers such as piezoelectric crystals are respectively operatively associated with said tips, with the intercoupling areas of the crystals and coaxial cable conductors coupled thereto being constructed to provide maximum shielding of such areas against external electromagnetic-wave or other interference. The rearward face of each crystal is connected by highly flexible conductor means to the central conductors of the coaxial cables. The forward faces of the respective crystals are preferably grounded through the tips and the jackets electrically connected thereto to the coaxial shields of the cables. Central members or plugs are employed to connect the shield to its respective jacket and at the same time isolate the crystal-connector junction areas.

3,580,058
DUAL ULTRASONIC SENSORS EMPLOYING A SINGLE MODE OF ULTRASONIC TRANSMISSION
Lawrence C. Lynnworth, Waltham, Mass., assignor to Panametrics, Inc., New York, N.Y.
Filed May 21, 1968, Ser. No. 730,713
Int. Cl. G01n *29/00*
U.S. Cl. 73—67.7 **13 Claims**



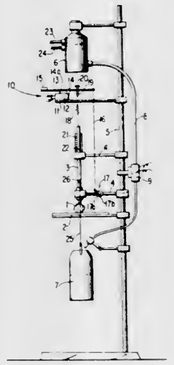
An ultrasonic measuring system for determining ambient conditions on two sensing elements. The elements may be positioned either to respond to a distribution in space of one ambient condition or to respond to two different ambient conditions in the same area. An ultrasonic transducer produces waves in only one ultrasonic mode, which are coupled to two sensors by means of a single lead-in element. The relative acoustic impedances of the sensors and their dimensions in a direction of propagation of the ultrasonic waves are such that the reflection pulses generated at each end of each of the sensors are identifiable with those ends of the sensors based upon their distribution in time, or their polarity or both. These dimensions and relative impedances are controlled so that reverberation pulses do not create an ambiguity and the identification of the primary marking pulses are generated at each end of the sensors.

3,580,059
SPHERICAL BEARING TESTER
Robert Barry Dalton, Monroe, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Jan. 13, 1969, Ser. No. 790,645
Int. Cl. G01m *13/04*
U.S. Cl. 73—71.5 **26 Claims**



A spherical bearing tester providing oscillatory rotating motion of the inner bearing race with respect to the outer bearing race about the thru-shaft longitudinal axis, also providing an oscillatory relative motion between the outer and inner races about an axis perpendicular to the thru-shaft longitudinal axis, also providing a bearing load along the axis of the thru-shaft, and also providing a bearing load so as to cause the outer race to attempt to move with respect to the inner race as a result of a force which is perpendicular to both the thru-shaft longitudinal axis and the axis about which the outer race oscillates with respect to the inner race.

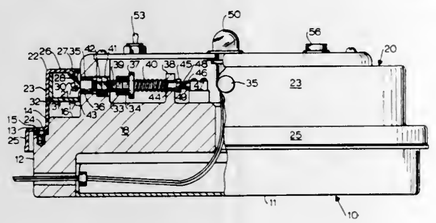
3,580,060
HARDNESS TESTER
Joseph E. Huskey, Copperhill, Tenn., assignor to Cities Service Company
Filed Oct. 24, 1968, Ser. No. 770,150
Int. Cl. G01n *3/18, 3/08*
U.S. Cl. 73—78 **4 Claims**



The hardness of crushable materials is determined by an apparatus capable of applying a uniformly increasing compression force to the material undergoing test. This force is

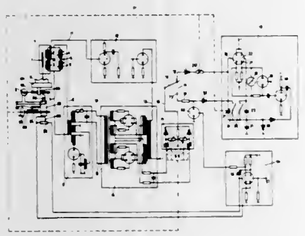
applied by a plunger exerting a downward pressure on the crushable material and by the weight of a receiving container suspended from the plunger. During the test, the weight exerted by the suspended container is continuously and uniformly increased by the flow of fluid from a reservoir tank into the receiving container. The flow of fluid is commenced by the opening of a normally closed solenoid valve in response to the closing of a relay switch. This switch is adapted to assume an open position when the weight of fluid in the receiving container becomes sufficient to cause the plunger to drop to a lower position upon crushing of the crushable material being tested. The opening of the relay switch, in turn, causes the solenoid valve to close upon crushing of the material being tested. The weight of the plunger and the suspended receiving container, together with the fluid in the container, provides a precise measure of the hardness of the crushable material.

3,580,061
SEAL-TESTING DEVICE
William H. Neuman, Cedar Falls, Iowa, and James A. Repella, Madison Heights, Mich., assignors to Federal-Mogul Corporation, Southfield, Mich.
Filed Jan. 16, 1970, Ser. No. 53,333
Int. Cl. G01n *3/08*
U.S. Cl. 73—88R **3 Claims**



A device for indicating whether a lip-type seal may be satisfactorily reinstalled. A simulated shaft and seal retaining environment is provided, and the simulated shaft has a plurality of radially extending members normally urged radially outwardly at a predetermined pressure. When the seal urges all of these members in at a somewhat greater pressure, a series circuit is completed to give a signal. The seal is deemed satisfactory if the signal remains in operation for a predetermined time interval.

3,580,062
SURFACE-MEASURING DEVICE
Johannes Perthen, 3 Sedanstr. 13, Hannover; Werner Gerighausen, Ronnenberg; Konrad Kunzmann, Rollinghausen, and Heinz Dreyer, Devese, Germany assignee said Gerighausen, said Kunzmann and said Dreyer assignors to said Perthen
Filed July 24, 1968, Ser. No. 747,317
Int. Cl. G01b *5/28*
U.S. Cl. 73—105 **2 Claims**

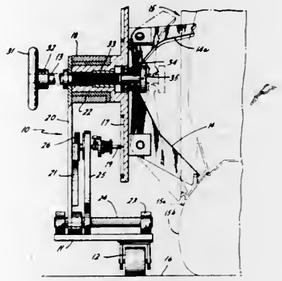


The device comprises mechanism for moving relative to one another a workpiece and a feeler point contacting the surface of the workpiece. An electromechanical transducer is mechanically connected to the feeler point for converting into electrical signals the movements of the feeler point normal to the surface of the workpiece, and is electrically connected through an amplifier to an electrical integrator for integrating such electrical signals. A device for determining the length of the relative movement of the workpiece and feeler point is connected to apparatus for determining the magnitude of the electrical signals integrated by the integrator, to vary the magnitude of the integrated signals inversely with the length of such relative movement, so that the integration determines the mean value of the profile of the surface of the workpiece independently of such length.

3,580,063
SYNCHRONOUS SPARK TIMER
Daniel M. Goodnow, Box 306F, Opel Road, Stone Haven, Rte. 1, Glen Burnie, Md.
Filed Apr. 11, 1969, Ser. No. 815,449
Int. Cl. G01m *15/00*
U.S. Cl. 73—118 **3 Claims**

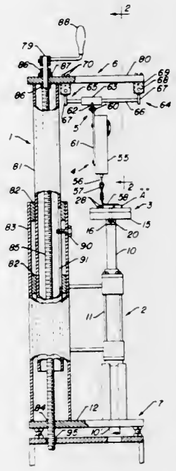
A test harness and spark electrode arrangement is provided for facilitating the timing of electrical ignition gas engines. A permanent magnet allows the electrode to be positioned anywhere on the engine block and is especially useful in conjunction with the flywheel or cam gear timing mark where the spark can be made to appear at only the correct timing interval.

3,580,064
RADIAL RUNOUT RECORDER
Ari Bar-on, Cherry Hill, N.J., and Norman M. Emslie, Yardley, Pa., assignors to Philco-Ford Corporation, Philadelphia, Pa.
Filed Mar. 27, 1969, Ser. No. 811,138
Int. Cl. G01m *17/02*
U.S. Cl. 73—146 **4 Claims**



Apparatus for recording "radial runout" of a loaded automobile wheel and tire combination. Linkage is provided to measure the radial runout while the wheel is under normal load, and includes a device—such as an elongate indicator-pen arm—to multiply the measurement. The multiplied value is recorded on a chart secured to the wheel and concentric therewith.

3,580,065
LAMINATE BOND PEELING STRENGTH TESTER
David J. Strittmater, and Nicholas W. Voelker, La Crosse, Wis., assignors to Universal Oil Products Company, Des Plaines, Ill.
Filed May 7, 1969, Ser. No. 822,558
Int. Cl. G01n *19/04*
U.S. Cl. 73—150 **10 Claims**

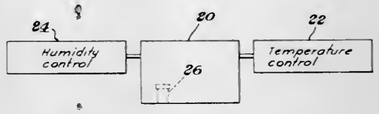


An apparatus for testing of laminate bonds having in a preferred embodiment a vacuum plate holddown device attached to a vertically movable fluid power-operated piston. A tension gage and clamping device is suspended above the piston and is free to move in a horizontal plane. The vacuum plate holds the sample in position while the clamping device is attached to a turned up strip of laminate. While being held in this position, the piston is moved downward at a fixed rate of speed, and the gage is read indicating the amount of forces exerted as the laminate is being peeled. In another embodiment a heating element and mechanically operated holddown device is provided therein to provide for testing under elevated temperatures.

3,580,066
METHOD FOR DETECTING EXPOSURE OF A BASE MATERIAL THROUGH AN OVERLYING COATING
William A. Pliskin, Poughkeepsie, and James E. Taylor, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 19, 1969, Ser. No. 834,884
Int. Cl. G01n *13/00*
U.S. Cl. 73—150 **6 Claims**

The method for determining the completeness of etching of an oxide from a silicon semiconductor device discloses that bare silicon surfaces are hydrophobic while clean freshly etched oxide surfaces are hydrophilic. To determine whether the silicon is exposed, and therefore free of any oxide film subsequent to etching, the device is cooled and subjected to a stream of moist gas and observed under a microscope. If the etching process by which small holes are formed is incomplete, oxide will remain in the hole and therefore a film of condensed water will form in the holes indicating incomplete etching. If the etching process has been properly completed in the holes, bare silicon will remain causing the moisture to form in small droplets. The form of the moisture can be observed through the microscope.

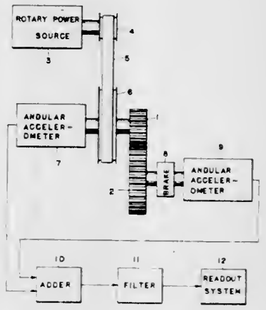
3,580,067
METHOD OF DETERMINING THE RATE OF VAPOR TRANSMISSION THROUGH SHEET MATERIALS
Melford E. Mandrell, and Wayne W. Blaser, Midland, Mich., assignors to The Dow-Chemical Company, Midland, Mich.
Filed Nov. 2, 1967, Ser. No. 680,128
Int. Cl. G01n *15/08*
U.S. Cl. 73—159 **1 Claim**



This invention relates to a method of determining the rate of vapor transmission through sheet materials wherein a defined area of test sheet material fitted over the end of a bottlelike element is exposed to standardized radioactive water under constant conditions of temperature and humidity.

Radioactive water which penetrates the test sheet is, for example, absorbed on calcium chloride. After a known time interval the calcium chloride is analyzed for radioactivity by means of liquid scintillation counting. The vapor transmission rate is calculated from the amount of radioactivity present in the calcium chloride.

3,580,068
APPARATUS FOR TESTING ROTARY POWER TRANSMITTING COMPONENTS
Louis S. Hoodwin, Rte. 1, Box 246, Sawyer, Mich.
Filed Aug. 26, 1968, Ser. No. 755,361
Int. Cl. G01m *13/02*
U.S. Cl. 73—162 **5 Claims**

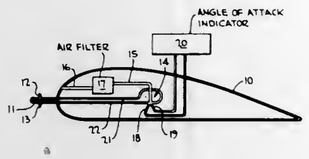


This invention describes apparatus for testing rotary power transmitting components by measuring the differential angular accelerations between the inputs and outputs of such components.

3,580,069
SUBSONIC FLUIDIC ANGLE-OF-ATTACK SENSOR
Raymond W. Warren, McLean, and Elmer L. Swartz, Annadale, Va. The United States of America as represented by the Secretary of the Army
Filed June 9, 1969, Ser. No. 831,526
Int. Cl. G01c *21/00*
U.S. Cl. 73—180 **11 Claims**

A fluidic angle-of-attack indicator for subsonic aircraft is disclosed. Two sensing tubes are located in that portion of the stagnation region of the wing of the aircraft where the flow separates and are used to control the output position of the power jet of a proportional fluid amplifier. As the angle of attack changes the rate of fluid entrainment from each of the sensing tubes changes and causes deflection of the power jet. The source of fluid for the power jet is derived from a

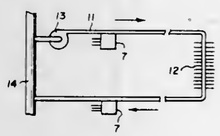
ram tube located on the wing surface, with an air filter being positioned between the power jet and the open end of the ram tube. The readout consists of a piston-type float which is responsive to a fluid pressure differential on its opposing sides. A side-slip indicator, using the above arrangement, is



provided by rotating the sensing tubes 90° and locating them in the stagnation region of the aircraft's vertical stabilizer.

The invention described herein may be manufactured, used, and licensed by or for the United States Government for governmental purposes without the payment to us of any royalty thereon.

3,580,070
HEAT METER
Edward H. Cumpston, Jr., 43 Monument Ave., Old Bennington, Vt.
Filed July 11, 1968, Ser. No. 744,000
Int. Cl. G01n *1/00*
U.S. Cl. 73—193 **9 Claims**

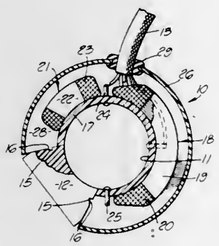


The heat carried by a variable temperature fluid moving at a known rate through a conduit is measured by recording the time required for a conductor thermally coupled to the conduit to lose heat to the conduit from a predetermined higher temperature that is maintained by a heater and a temperature-sensitive switch thermally coupled to the conductor.

ERRATUM

For Class 73—194 see:
Patent No. 3,580,092

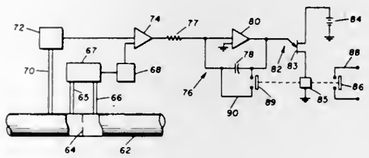
3,580,071
FLOWMETER PROBE
Norman A. Hickman, Ventura, Calif., assignor to Statham Instruments Inc., Oxnard, Calif.
Filed Feb. 26, 1969, Ser. No. 802,517
Int. Cl. G01p *5/08*
U.S. Cl. 73—194 **9 Claims**



An insulative hollow cylindrical tube of inner bore sufficient to accommodate a blood vessel under test, has a longitudinal wedge-shaped portion that is removable to provide an access opening. A first magnetizing coil includes a core that extends circumferentially about the insulative cylinder of substantial angular extent. A second coil has a core extending in the same direction, but of substantially less angular extent than the core of the first coil. The two coils are serially related and energized to induce a potential in the flowing blood which is measured by electrodes carried by the insulative cylinder. The entire assembly is enclosed with a further cover cylinder concentrically arranged about the first coil and end plates.

The present invention relates generally to a blood flowmeter, and, more particularly, to a probe for mounting about a blood vessel to measure the flow rate of blood passing therethrough.

3,580,072
TIME AVERAGING METHOD AND APPARATUS FOR OBTAINING FLUID MEASUREMENTS
John B. Cox, and Jacque R. Stoltz, Midland, Tex., assignors to Mobil Oil Corporation
Filed Dec. 27, 1967, Ser. No. 693,867
Int. Cl. G01p *5/00*
U.S. Cl. 73—205 **5 Claims**

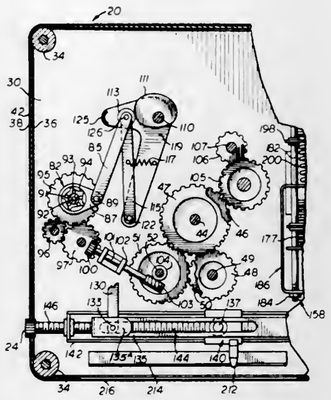


This specification discloses a method and apparatus for accumulating signals from a water-cut monitor and a flow meter in a form whereby the net oil and net water in an oil-water mixture may be determined. A flow meter signal in the form of constant-amplitude, frequency-variable DC pulses is applied to a capacitor to charge the same. A signal from the water-cut monitor is modulated in proportion to the meter signal in order to produce a modulated signal of DC pulses in which pulse amplitude is proportional to water content and pulse frequency is proportional to flow rate. This modulated signal is stored on another capacitor. Both capacitors are interrogated at periodic time intervals in order to obtain readout signals representative of the charges thereon and the capacitors are discharged. Also disclosed is a system for obtaining gas flow information. In this system a pressure signal is modulated in proportion to a ΔP signal to produce a modulated signal of DC pulses which is applied to a capacitor. The capacitor is interrogated as described above.

3,580,073
TEMPERATURE COMPENSATOR
Howard E. Siebold, Libertyville, Ill., assignor to Liquid Controls Corporation, North Chicago, Ill.
Filed June 3, 1968, Ser. No. 733,995
Int. Cl. G01f *3/02*
U.S. Cl. 73—233 **14 Claims**

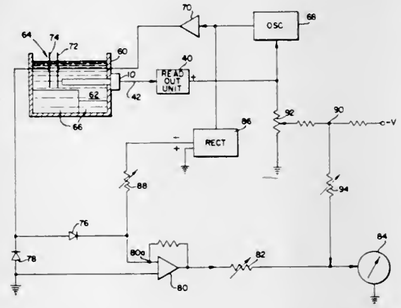
A temperature compensator modifies the output from a volumeter to compensate for the effect of temperature changes on the volume of a fluid being metered and includes a differential gear train having an output shaft that rotates at a speed equal to the rotational speed of one of its inputs, which is dependent on the volume of the fluid being measured, minus the rotational speed of its other input, which is dependent on the difference in temperature between the temperature of the fluid being metered and a standard temperature. The temperature-dependent input is controlled by a

pair of reciprocating linkages, which are pivotally connected to a bellcrank, which pivots in response to a temperature-



sensing device, for adjustably controlling the length of the stroke of the reciprocating linkages.

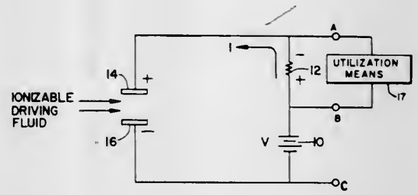
3,580,074
TEMPERATURE-COMPENSATED LIQUID QUANTITY GAGE
Vernon C. Wescott, Lincoln, and Sidney B. Williams, Lexington, Mass., assignors to Trans-Sonics, Inc., Lexington, Mass.
Filed May 23, 1969, Ser. No. 827,276
Int. Cl. G01f *23/26;* **G01k** *7/12*
U.S. Cl. 73—304C **6 Claims**



A temperature sensor comprises the usual "hot" thermocouple junction exposed to the temperature to be monitored, a reference junction, a thermally sensitive resistor connected to compensate for changes in the temperature of the reference junction and a readout unit that converts the outputs of these elements to a temperature indication. The reference junction and the resistor are located in the probe that contains the hot junction, so that the leads extending from the probe to the readout unit need not be made of the materials of which the thermocouples are made. The thermally sensitive resistor is in series with the hot junction and reference junction. This permits the use of a single pair of leads to carry current for the resistor and, at the same time, bring back to the readout unit a net voltage comprising the thermocouple junction voltages and the compensating voltage from the resistor.

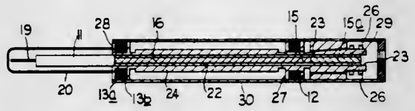
A capacitive-type liquid quantity gage extending partway down into a tank includes a capacitive liquid level sensor and a temperature sensor positioned to sense the temperature of the liquid monitored by the level sensor. The output of the temperature sensor controls the drive voltage to the level sensor so as to compensate for changes in density and dielectric constant resulting from temperature changes in the liquid. The resulting compensated signal is further adjusted by subtracting from it a signal derived from the temperature sensor to account for expansion or contraction of the liquid below the bottom of the level sensor.

3,580,075
PRESSURE TRANSDUCER FOR IONIZABLE FLUIDS
David R. Steinberg, Raleigh, N.C., assignor to Corning Glass Works, Corning, N.Y.
Filed July 31, 1967, Ser. No. 657,370
Int. Cl. B21d *28/00*
U.S. Cl. 73—339 **11 Claims**



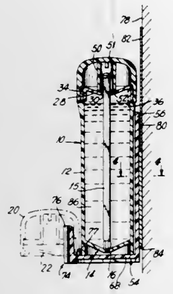
A pressure transducer for ionizable fluids having no vibrating or moving parts and capable of reliable operation at high ambient temperatures is disclosed. The driving fluid to be detected is introduced into a space between a pair of electrodes across which an ionizing electrical potential exists. Ionic current flow between the transducer electrodes is a function of the instantaneous density of the driving fluid within the interelectrode space and produces corresponding current and voltage drops in an external circuit of sufficient intensity to drive detectors, amplifiers, or a variety of electrical instruments.

3,580,076
ACOUSTIC THERMOMETERS
Eric George Herbert Mobsby, Blandford Forum, England, assignor to United Kingdom Atomic Energy Authority, London, England
Filed June 28, 1967, Ser. No. 649,516
Claims priority, application Great Britain, June 29, 1966, Nov. 21, 1966, 29316/66;52098/66
Int. Cl. G01k *11/24*
U.S. Cl. 73—339 **2 Claims**



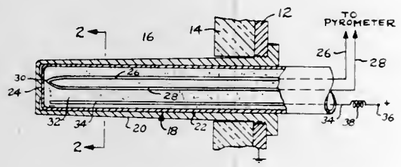
A thermometer which measures temperature by the time taken by a sound pulse to travel along a probe. The sound pulse emanates from a transducer coil and magnetostrictive element and travels in two opposite directions. One direction is toward a terminal mass polarized by a magnet where the sound is reflected by the terminal mass and so phased to increase the pulse width at the point of emanation. The other direction of the pulse is toward a probe by way of the magnetostrictive element itself and a transmission line. Reflections from the two ends of the probe are sensed and the time between the reflected pulses from the ends of the probe is measured as function of temperature. The magnetostrictive element is preferably twisted along its length.

3,580,077
CLINICAL THERMOMETER STORAGE AND STERILIZING APPARATUS
Seymour N. Blackman, 3 Horizon Road, Penthouse #4, Fort Lee, N.J.
Filed Nov. 18, 1968, Ser. No. 776,363
Int. Cl. G01k *1/00, 1/14;* **A61l** *3/00*
U.S. Cl. 73—343 **10 Claims**



A thermometer storage container is cylindrically shaped and longitudinally ribbed along its outer surface. The ribs engage resilient gripping flanges on a wall bracket permitting the container to be snapped forwardly into the bracket and axially withdrawn therefrom. A drip proof cover engages a diaphragm at the upper end of the container and encases the upper portion of a thermometer which projects through the diaphragm. The lower portion of the thermometer within the container below the diaphragm is immersed in propylene glycol which functions as a cold-sterilizing solution and additionally acts as a lubricant for rectal insertion of the thermometer.

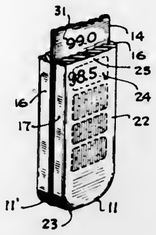
3,580,078
THERMOCOUPLE FAILURE INDICATING DEVICE
Douglas James MacKenzie, Park Ridge, Ill., assignor to American Standard Inc., New York, N.Y.
Filed Apr. 16, 1969, Ser. No. 816,752
Int. Cl. G01k *1/08, 7/02*
U.S. Cl. 73—344 **4 Claims**



A thermocouple for immersion in a bath of molten metal, or other liquid, comprising a closed-ended sheath having crushed ceramic insulation packed therein to thermally insulate certain hot junction wires contained within the sheath. A special auxiliary conductor is arranged within the sheath to energize an alarm circuit should a rupture develop in the sheath wall. Such rupture causes the molten metal to saturate the ceramic and electrically connect with the conductor for developing the alarm signal.

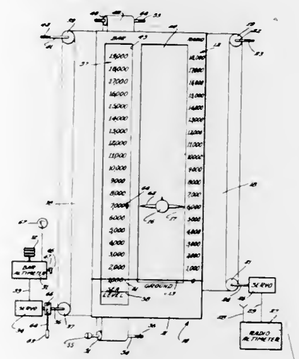
3,580,079
THERMOMETER INDICATOR
Nelson A. Crites, and Donald H. Lyons, Columbus, Ohio, assignors to Abbott Laboratories, North Chicago, Ill.
Filed Mar. 6, 1969, Ser. No. 804,878
Int. Cl. G01k *11/06;* **G02b** *5/24*
U.S. Cl. 73—358 **9 Claims**

A disposable clinical thermometer contains a temperature responsive material within a cell having a viewing window. The window is made translucent by abrading or roughening its inner surface to diffuse light passing therethrough. When a predetermined temperature is reached, the material melts, spreads over and wets the roughened surface to optically



smooth it, thereby making it transparent. Indicia of temperature, previously obscured by the translucent window and the solid state temperature responsive material then becomes visible to one reading the thermometer.

3,580,080
FULL DATA ALTIMETER DISPLAY
Earl Stuart Perkins, Oak Brook, Ill., assignor to Butler National Corporation, Minneapolis, Minn.
Filed Feb. 4, 1969, Ser. No. 796,491
Int. Cl. G01l *7/20*
U.S. Cl. 73—384 **9 Claims**

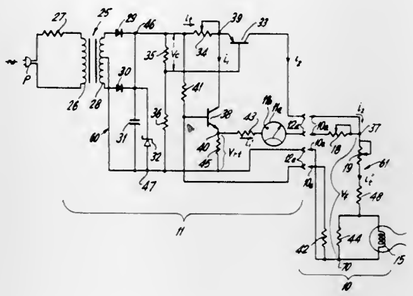


An altimeter which continuously presents to the pilot the altitude of an aircraft above ground derived from a radio altimeter or other source and which simultaneously presents to the pilot the altitude above sea level and ground obtained from a barometric altimeter. Means are provided for adjusting the reference on the barometric altimeter presentation so that the altitude of the terrain will be indicated.

3,580,081
VACUUM GAUGE
Sol Greenberg, Roslyn; Heinz Rosen, Hicksville; Richard Weinberger, Oceanside, and Guy Mongodin, Huntington, N.Y., assignors to Veeco Instruments, Incorporated, Plainview, N.Y.
Filed Sept. 10, 1969, Ser. No. 856,686
Int. Cl. G01l *21/12*
U.S. Cl. 73—399 **18 Claims**

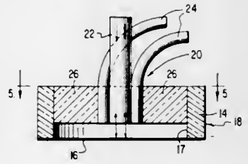
Disclosed herein is a Pirani-type pressure gauge having a sensor head incorporating a pressure-responsive filament, a calibrated pressure indicator, and related circuitry for converting the voltage drop across the filament into a meaningful pressure indication. The net current supplied to the filament includes both an energizing component and an indicator drive component. This net current is maintained constant by a constant current source so that, excluding ambient temperature affects, the voltage across the filament is indicative

of filament resistance and consequently ambient pressure, notwithstanding the effect of the indicator. Temperature effects are minimized by a simple compensating impedance in the filament-indicator circuit which also includes scale-



calibration controls and means for shaping filament response. The calibration, compensation, and shaping components are located in the filament sensor head in such a manner as to obviate the usual field adjustments required to match the sensor head and indicator.

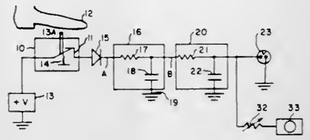
3,580,082
PRESSURE TRANSDUCER
Richard R Strack, Sturbridge, Mass., assignor to The Bendix Corporation, Detroit, Mich.
Division of Ser. No. 673,578, Oct. 9, 1967, Pat. No. 3,503,116, Mar. 31, 1970.
application Nov. 7, 1969, Ser. No. 871,264
Int. Cl. G01l *7/08*
U.S. Cl. 73—406 **9 Claims**



A pressure transducer having a thin, edge-supported light-reflecting membrane or membranes with light-transmitting optical fibers for directing collimated light to the membrane for reflection thereby. A plurality of light-receiving optical fibers are disposed around each light-transmitting fiber and are connected to a light intensity measuring device. Upon membrane deflection, the direction of light reflected therefrom is changed, thereby changing the amount of light incident on the light-receiving fibers. The resultant change in light intensity transmitted to the measuring device serves as a measure of the membrane deflection and therefore the pressure acting thereon.

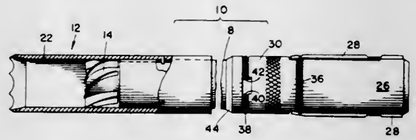
3,580,083
SPEED-MEASURING DEVICE
Frederick S. Zipser, 32 S. Broadway, Red Hook, N.Y.
Filed Dec. 18, 1968, Ser. No. 784,859
Int. Cl. G01l *3/00, 5/02*
U.S. Cl. 73—432R **6 Claims**

A device for measuring the rate of speed or distance covered by a person moving or running in place including a generator producing an electrical pulse each time a football is made, a device for calculating the rate at which the pulses occur, and a device for indicating the calculated rate. For distance measurements, a preset distance-factoring device can be adjusted so as to provide an indication of the distance covered between successive electrical pulses in accordance with the characteristic of the moving individual, and a counting device for counting up the number of electrical pulses in accordance with the factor. In an alternative embodiment, high-frequency generators can be used along with a counting device for digitally accumulating electrical pulses in ac-



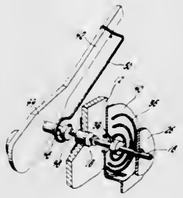
cordance with the interval between footfalls: and a device for producing an electrical pulse amplitude in accordance with the number of pulses representing the intrafootfall spacing, and indicating the rate and distance covered thereby.

3,580,084
PNEUMATIC PROBE SAMPLER
Harold A. Kramer, West Hyattsville, Md., assignor to The United States of America as represented by the Secretary of Agriculture
Filed Jan. 24, 1966, Ser. No. 522,784
Int. Cl. G01n *1/14*
U.S. Cl. 73—421 **3 Claims**



A pneumatic probe for taking samples of grain and other particulate material from the bottom of a bin comprises two concentric tubes spaced sufficiently apart to permit passage of the material when entrained in a stream of air. The outer longer tube has a serrated edge to enable it to penetrate dense sections, while the inner, shorter tube is provided with helical vanes. Air, blown down the outer tube is caused to swirl in a vortex by the helical vanes, thereby entraining material lodged near the bottom of the outer tube. The air, together with entrained material, passes up the inner tube and is conducted to a cyclone separator to recover the sample.

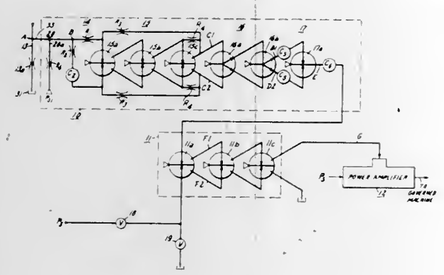
3,580,085
POINTER STABILIZER
Alan L. Hitzelberger, Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed June 2, 1969, Ser. No. 829,585
Int. Cl. G01p *1/08;* **G01d** *11/10*
U.S. Cl. 73—496 **1 Claim**



The invention relates to a speedometer. The following specification describes a speedometer having an improved indicating mechanism. The hub of the indicating needle is

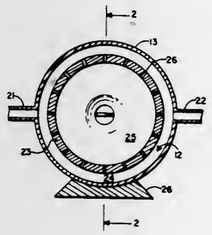
machined to act as a bearing on the spindle, and the needle and spindle are interconnected by a damping member to filter out oscillations occurring in the pointer.

3,580,086
FLUIDIC SPEED GOVERNOR
Martin C. Doherty, Scotia, N.Y., assignor to General Electric Company
Filed Mar. 20, 1969, Ser. No. 808,869
Int. Cl. G01p *3/26*
U.S. Cl. 73—506 **7 Claims**



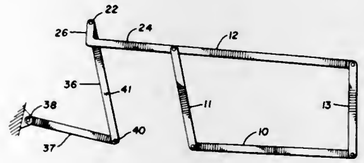
A fluidic speed governor for controlling the speed of pneumatic or hydraulic machines senses the machine speed directly from pressure pulsations in the pressurized fluid supply or exhaust of the machine. The governor includes a fluidic speed-sensing circuit having no moving mechanical parts and an input connected to the pressurized fluid supply or exhaust of the machine for generating a DC-type pressurized fluid signal having a pressure magnitude proportional to the pressure pulsation frequency which is directly proportional to the actual machine speed. A second fluidic circuit connected to the output of the first circuit is provided with a speed reference input signal and generates a pressurized fluid signal indicative of the deviation of the actual machine speed from the reference speed. A fluid power amplifier connected to the output of the second circuit develops a pressurized fluid flow for controllably driving the governed machine.

3,580,087
FLUID ACTUATED INSTRUMENT SENSITIVE TO DENSITITY TEMPERATURE OR LINEAR ACCELERATION
Richard L. Sampson, Excelsior, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Nov. 21, 1968, Ser. No. 777,833
Int. Cl. G01p *15/00;* **G01k** *1/00*
U.S. Cl. 73—515 **10 Claims**



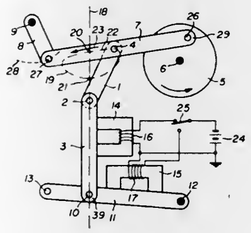
Apparatus for measuring fluid temperature, fluid density, or acceleration, including a cylindrical chamber having a pair of radial input connections at diametrically opposite points and an axially output connection including means responsive to any vortical component of fluid flow therein. Concentric with the housing, and of somewhat smaller diameter, is an annular coupling element for insuring initial radial flow of fluid toward the output connection. The apparatus is mounted for acceleration normal to the axis of the chamber. If this acceleration is constant (e.g. gravity) and fluids of different temperatures or different densities are supplied to the input connections, the discharging fluid has a vortical component which varies with the temperature difference or the density difference, and if one temperature or one density is also held constant, the vortical component varies with the other temperature or density. If, on the other hand, the temperatures or densities are held constant, or their differences are held constant, the vortical component varies with the acceleration.

3,580,088
CURVE GENERATING LINKAGE
James A. Clark, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed May 1, 1968, Ser. No. 725,816
Int. Cl. F16h *21/00*
U.S. Cl. 74—1 **2 Claims**



A multibar linkage is used to produce a noncircular motion for generating aspherical surfaces. Linkages can be optimized to conform their output motions very accurately to predetermined curves such as those developed by optical designers for aspheric lenses and mirrors. Also, in optical design, the parameters of linkages may be used in place of mathematically expressed curves thus facilitating the simultaneous optimization of an optical system and a linkage for producing an aspheric surface for the system. A dressing tool mounted on the linkage dresses a cutting wheel to conform it to the desired curvature. The wheel shapes the workpiece accordingly.

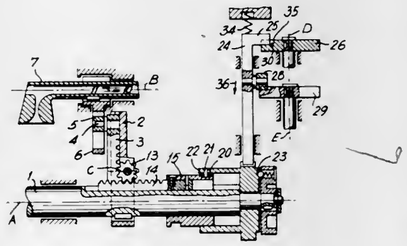
3,580,089
MOTION-CONVERTING MECHANISM
Serge Ramseier, Carouge, Geneva, Switzerland, assignor to The Battelle Development Corporation, Columbus, Ohio
Filed Nov. 21, 1968, Ser. No. 777,665
Claims priority, application Switzerland, Nov. 21, 1967, 16377/67
Int. Cl. F16h *21/18*
U.S. Cl. 74—49 **16 Claims**



A mechanism for converting the continuous rotational motion of a crankpin into an alternating motion of a lever by means of two hinged levers, the free end of one lever being connected to the crankpin and the free end of the other lever able to move along a substantially rectilinear path (output). The connection between the crankpin and the free end of the first lever is such that the latter may describe cyclically a closed drive path located on opposite sides of the extended rectilinear path described by the free end of the second lever. Two holding members act respectively on the second lever to prevent it from moving otherwise than by a sliding motion along the latter rectilinear path, and on the guide element to

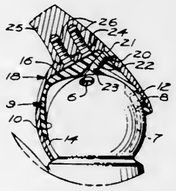
immobilize it at a fixed point coinciding with the upper end of this alternating motion. Either one or the other of the holding members is made operative and the first is arranged so as to form, when energized an abutment against which the second lever can back on to as soon as the free end of the first lever has crossed the rectilinear path (working stroke) and from which the second lever may move away when it is not energized by pivoting about the fixed point (idle stroke).

3,580,090
WINDING PITCH CHANGER OF A STATOR-WINDING MACHINE
Alexandr Andreevich Bondarenko, Moskovsky prospekt, 198/2, Kv. 69, and Fedor Grigorievich Klevanov, ulitsa Kotovskogo, 62-9, Kharkov, U.S.S.R.
Filed June 20, 1969, Ser. No. 835,170
Int. Cl. F16h *22/44;* **H16h** *21/00;* **B65h** *81/06*
U.S. Cl. 74—96 **2 Claims**



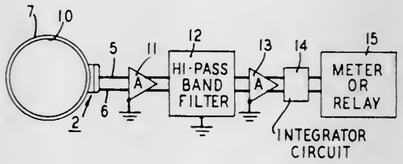
A winding pitch changer of a stator-winding machine comprises a changeover transmission for swinging a winding head and connected mechanically with an adjusting mechanism, the changeover transmission being in the form of a ratchet with a retainer linked kinematically with a former cam which is connected mechanically with a slide located in the slot of a link mechanism which rotates the winding head rod, the slide being moved at the moment when the ratchet is braked by the adjusting mechanism. The adjusting mechanism comprises a spring-loaded slide provided at one end with a stop interacting with a splined disc and a roller interacting with a cam which is kinematically linked with the splined disc while at the other end it has a tooth for braking the ratchet at the moment of the pitch change.

3,580,091
ACTUATOR FOR MIXING VALVE
Lloyd Spencer, 220 Patrician Way, Pasadena, Calif., and Tor Petterson, 1344 E. 6th St., San Pedro, Calif.
Filed Apr. 10, 1969, Ser. No. 814,991
Int. Cl. F16h *21/44*
U.S. Cl. 74—107 **6 Claims**



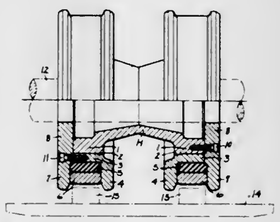
An actuator for a hot and cold water mixing valve, the valve terminating in a journal ball in which is mounted a pair of valve operating cam followers movable in parallel axes, the journal ball terminating in an annular stop shoulder; the actuator including an inner cap member having internal cam areas engageable by the cam followers and a peripheral movement limiting cam engageable with the stop shoulder, the cap member covering more than half the journal ball and slitted so as to be fitted thereon or removed therefrom; and a shell member conforming to the inner cap member to prevent expansion and thereby secure the cap member on the journal ball for universal movement of the cap and shell members, the shell member being secured to the cap member by an externally accessible fastener.

3,580,092
ACOUSTIC FLOWMETER
Thomas J. Scarpa, Edison, N.J., assignor to Scarpa Laboratories, Inc.
Filed Dec. 23, 1969, Ser. No. 887,505
Int. Cl. G01f *1/00*
U.S. Cl. 73—194 **21 Claims**



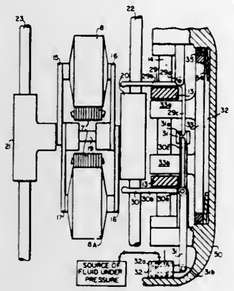
A clamp-on flowmeter having a pickup element designed to be removably secured on an external surface of a pipe, which is responsive to ultrasonic radiation generated by shear action of fluid flowing in the pipe. The signal from the pickup element is filtered, frequency-selectively amplified, and integrated, the output being used to operate indicating means, and various types of relay-actuated devices. In one embodiment, the pickup element is a piezoelectric wafer; and the response characteristic for the overall circuit including the pickup element is designed to be fairly uniform over a broad range of frequencies extending from just above the audio range to at least about 100 kilocycles. In a modification of this, the pickup element is designed to respond to a relatively narrow band of frequencies well above the audio range, to which band the amplifier-integrator circuit is specifically tuned.

3,580,093
LOWER ROLLER FOR ENDLESS TREAD FOR VEHICLE
Kazuhiro Tomizawa, Tokyo, Japan, assignor to Nittai Lease Company, Ltd., Tokyo, Japan
Filed Mar. 10, 1969, Ser. No. 805,395
Int. Cl. B62d *55/14*
U.S. Cl. 74—230.3 **1 Claim**



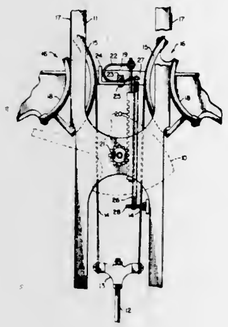
A lower roller for the endless treads of various vehicles, particularly to a lower roller comprising a hub, elastic element provided between tire flanges and metal ring provided around said elastic element.

3,580,094
MOTION TRANSMISSION DRIVE
Charles E. Kraus, Allendale, N.J., assignor to Excelermatic, Inc.
Filed Aug. 27, 1969, Ser. No. 853,429
Int. Cl. F16h *7/12*
U.S. Cl. 74—242.11C **16 Claims**



A traction drive with movable flange pulleys on parallel shafts which operates with a large amount of traction element sag, both on the tight and slack side, maintained by a dual roller tensioning means which, through servo means, compensates for load, wear, and ratio position by controlled flange movements.

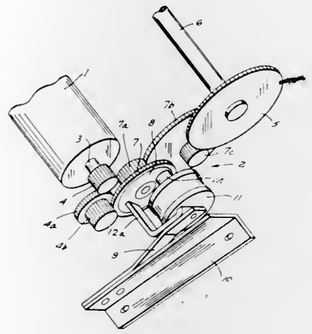
3,580,095
CONSTANT MESHING FORCE RACK AND PINION
Aniese E. Seed, Toledo, Ohio, assignor to The Reliance Electric and Engineering Company, Toledo, Ohio
Filed Jan. 13, 1969, Ser. No. 790,605
Int. Cl. F16h *55/18;* **G01g** *13/14*
U.S. Cl. 74—409 **4 Claims**



In a condition responsive device, such as a load responsive weighing scale, a rotatably mounted pinion is engaged with a pivotably mounted balanced rack which is movable in response to change in the condition. A spring is provided for urging the rack into engagement with the pinion and for maintaining the meshing force between the rack and the pinion substantially constant during all positions of the rack.

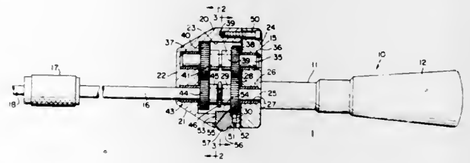
3,580,096
DRIVING MECHANISM FOR SLIDE CHANGERS OR THE LIKE
Josef Scheibel, Ober-Morlen, Germany, assignor to Braun Aktiengesellschaft, Frankfurt, Main, Germany
Filed Sept. 5, 1969, Ser. No. 855,529
Claims priority, application Germany, Oct. 2, 1968, P1800516.8
Int. Cl. F16h *57/10;* **F16d** *67/06*
U.S. Cl. 74—411.5 **16 Claims**

The slide changer and the indexing mechanism for the tray of a slide projector are operated intermittently by a power train which is connected to the output shaft of an electric motor. An electromagnet is energized in response to opening of the motor circuit to bring about rapid stoppage of the slide changer and indexing mechanism in a predetermined position. Energization of the electromagnet results in frictional



engagement of an element of the power train with a movable or stationary part of the electromagnet. A spring is provided to disengage the element of the power train from the stationary or movable part in response to deenergization of the electromagnet.

3,580,097
SCREW AND NUT DRIVER
Leonard Van Dalen, Cherry Hill, N.J., assignor to Seaboard Fabricators, Inc.
Filed Mar. 4, 1969, Ser. No. 804,139
Int. Cl. F16h *1/20;* **B25b** *17/02*
U.S. Cl. 74—421 **9 Claims**

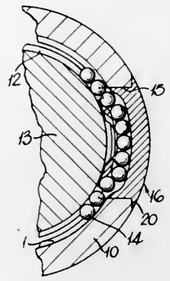


A screw and nut driver including a housing mounting a gear train, a handle and a tool shank extending from opposite ends of the housing and respectively connected to the input and output of the gear train.

3,580,098
BALL SCREW AND NUT MECHANISM
Albert Goad, Hemel Hempstead, England, assignor to Rotax Limited, London, England
Filed Apr. 25, 1969, Ser. No. 819,352
Claims priority, application Great Britain, Apr. 29, 1968, 20134/68
Int. Cl. F16h *55/22, 1/18*
U.S. Cl. 74—459 **3 Claims**

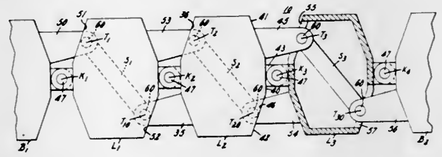
A ball screw and nut mechanism including an insert which is positioned within a recess in the nut, the insert defining

scoop portions which depend into the groove in the screw, the scoop portions being interconnected by a passage



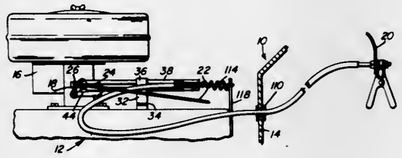
whereby balls can recirculate during relative angular movement of the nut and screw.

3,580,099
ARTICULATING MECHANISM
Ralph S. Mosher, Schenectady, N.Y., assignor to General Electric Company
Filed Sept. 24, 1969, Ser. No. 860,640
Int. Cl. G05g *1/00*
U.S. Cl. 74—469 **10 Claims**



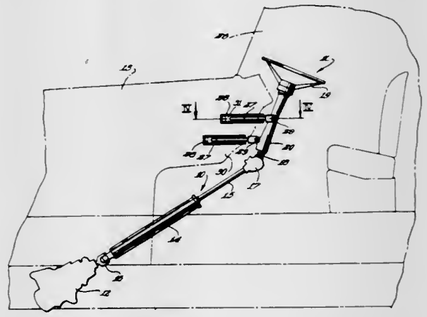
An articulating mechanism to provide large angular motions using a plurality of links, one of which includes a long and a short member in crossed relationship and a pair of side bars each pivotally connected to respective adjacent ends of the members. Extension bars on one side and on the other side of the long member and integral therewith function as side bars of a preceding and a succeeding link. Elimination of one type of extension bar on a link at one end of the mechanism and the other type of extension bar on a link at the other end of the mechanism provides transitional links for pivotal connection of the long cross bar of each of the transitional links to a respective rigid member.

3,580,100
DRIVER TRAINING CAR THROTTLE DISCONNECT
Louis W. McDermott, c/o McDermott Ford Sales, R. R. #1, Dyersville, Iowa
Filed Dec. 30, 1969, Ser. No. 889,269
Int. Cl. G05g *11/00*
U.S. Cl. 74—482 **10 Claims**



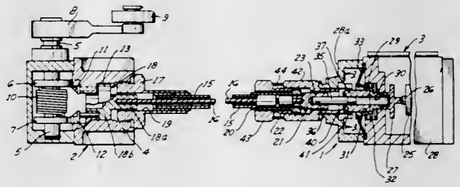
A selectively remotely actuatable control for operative connection between the throttle linkage and throttle valve control arm of an automotive carburetor including means operable, when the control is actuated, to render inoperative a normally operative motion-transmitting connection between the throttle linkage and the throttle valve control arm and return, by spring return means, the throttle valve control arm to its idle position independent of the position of the throttle linkage.

3,580,101
TELESCOPING SECTION IN A STEERING COLUMN
Anker E. Jorgensen, Portland, Oreg. and Gerald K. Oxley, Lafayette, Ind., assignors to TRW Inc., Cleveland, Ohio
Filed Nov. 12, 1968, Ser. No. 774,911
Int. Cl. B62d *1/18*
U.S. Cl. 74—493 **1 Claim**



Telescoping section between a steering shaft and steering gear, comprising an elongated tube and an intermediate shaft sliding connected therewith for rotational driving. The intermediate shaft journaled in a bushing in the end of the elongated tube. An internal stop in the tube spaced from but near the bushing prevents buckling between the tube and the shaft. The steering shaft housing is adjustably mounted in the vehicle cab by means of adjustable brackets attached to the dashboard of the vehicle cab and the steering shaft housing.

3,580,102
ADJUSTABLE FLEXIBLE CABLE FORCE TRANSMITTING ASSEMBLY
Voyta E. Wrabetz, Hubertus, and Ronald A. Banister, Mequon, Wis., assignors to Square D Company, Park Ridge, Ill.
Filed June 30, 1969, Ser. No. 837,813
Int. Cl. F16c *1/22*
U.S. Cl. 74—501 **7 Claims**

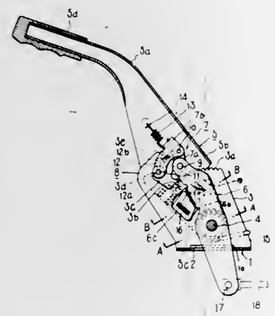


The flexible cable assembly comprises an outer sheath and inner cable with plungers on its ends, respectively, for transmitting normal operating forces in a direction from an operator at one end of the assembly to a switch at the opposite end. Adjustment means are connected to one plunger and are arranged to be changed in overall length by opposed forces imposed thereon by, and endwise of, the cable in excess of the normal operating forces. The adjustment means is adjusted to the effective length required for proper operation of the switch by the operator by operating the remote operator through one complete operating cycle while the operator, the switch, and the assembly are in final installed position. The effective length remains unchanged thereafter.

3,580,103
REMOTE FLEXIBLE CABLE
Russell L. Shreve, Troy, Mich., assignor to Teleflex Incorporated, North Wales, Pa.
Filed Aug. 1, 1969, Ser. No. 846,713
Int. Cl. F16c *1/28*
U.S. Cl. 74—501 **10 Claims**

A remote flexible control cable for transmitting tensile and compressive forces by means of a band member which is supported between two sets of a plurality of ball members with each set of ball members being held in place by a retainer and supported between a race or guide member and the band member; the sets of ball members, retainer and race or guide members all being supported for rotation within the cable; and the control cable being flexible in two directions in a common plane.

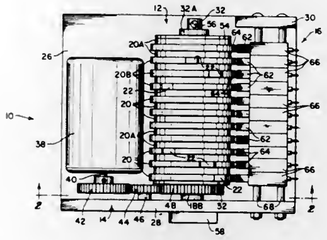
3,580,104
CONTROL LEVER FOR PARKING BRAKE SYSTEMS
Katsuji Yashiro, and Hiroshi Naito, Kanagawa-ken, Japan, assignors to Otsukakoki Kabashiki Gaisha, Yokohama-shi, Japan
Filed Jan. 24, 1969, Ser. No. 793,768
Claims priority, application Japan, July 29, 1968, 43/052960
Int. Cl. G05g *5/18*
U.S. Cl. 74—535 **5 Claims**



The control lever comprises a hand lever pivotably mounted on a fixed ratchet sector and biased to the brake releasing position. A locking lever is pivotably supported on the ratchet sector for connection with a brake mechanism and is pivotably connected to a ratchet piece having a pawl engageable with the teeth on the sector, the ratchet piece in turn being connected to a link engaged in a slot provided in the hand lever. When the hand lever is moved between the brake release position and the brake actuating position, the pawl can travel past the teeth of the ratchet sector by oscillation of the ratchet piece and link as a result of displacement of the pin in the slot. A spring acts on the link to urge the pawl into engagement with the teeth when the hand lever reaches the brake actuating position.

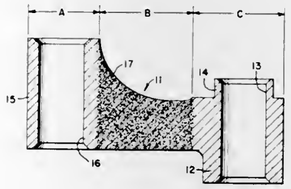
3,580,105
PROGRAM CONTROL APPARATUS
Warren E. Gilson, 4801 Sheboygan Ave., Madison, Wis.
Filed May 9, 1969, Ser. No. 823,411
Int. Cl. F16h *54/04*
U.S. Cl. 74—568 **11 Claims**

A program control apparatus includes a drum mounted for rotation and a stack of cam rings removably supported upon the drum surface. The cam rings include outwardly projecting partly cut away flanges formed of easily removable material providing cam surfaces for the control of a program operation through a series of cam follower devices. The drum is mounted only at one end by means of a shaft connected to



a wall portion of a support, the support also supporting drive means for rotating the drum and the cam follower devices. The arrangement permits rapid and convenient setup and adjustment of programs through cutting away of portions of the cam ring flanges, through exchange of the cam rings, and through exchange of the entire drum assembly.

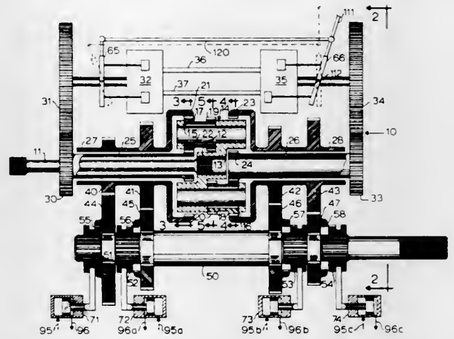
3,580,106
ALUMINUM PRESSED METAL LINK FOR 600 CLASS SEWING MACHINES
Frederick R. Wiehl, Westfield, and Edmund B. Wilson, III, Dover, N.J., assignors to The Singer Company, New York, N.Y.
Filed Sept. 23, 1969, Ser. No. 860,269
Int. Cl. F16c *7/02*
U.S. Cl. 74—579 **3 Claims**



A drive link is disclosed for a sewing machine needle bar reciprocating mechanism. The drive link is constructed of an alloy containing principally aluminum and is formed at each extremity with porous lubricant accommodating bearing portions having a density which is a fraction of the theoretical solid alloy density of the aluminum alloy so as to provide porosity for lubricant retention and self-oiling bearing characteristics. The portion of the drive link joining the bearing portions, however, possesses superior structural characteristics because it is formed to a density which is substantially equal to the theoretical solid alloy density of the aluminum alloy which is used.

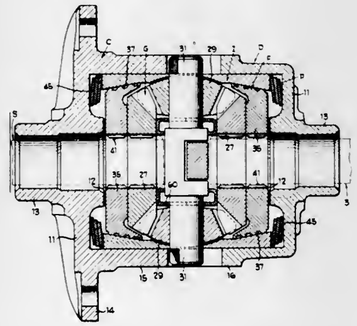
3,580,107
TRANSMISSION
Elias Orshansky, Jr., San Francisco, Calif., assignor to URS Systems Corporation, San Mateo, Calif.
Filed Oct. 21, 1968, Ser. No. 769,008
Int. Cl. F16h *47/08*
U.S. Cl. 74—687 **93 Claims**

Power is transmitted by a planetary and hydraulic assembly which has one input shaft, two output means, and two reactions. While one output means is increasing its speed, the other output means is simultaneously decreasing its speed, and the ratio of the maximum speed of one output means to its minimum speed is substantially the same as the ratio of the maximum speed of the other output means to its minimum speed. This characteristic of speeding up one output means while the other slows down is used over and over again by shifting the final output from the point where one of the output means is going at maximum speed to the other output means when it is going at minimum speed, thus going through this cycle again and again. The power transmission therefore connects successively the final output drive to one



output member of the planetary assembly and then to the other output member of the planetary assembly, and then back to the first output member of the planetary assembly at a different ratio from the previous connection, and so on, and this can be done because these output means continually increase and decrease their speeds.

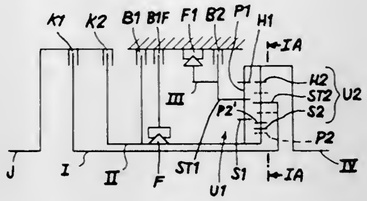
3,580,108
DIFFERENTIAL MECHANISM
Spencer H. Mieras, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Dec. 2, 1969, Ser. No. 881,346
Int. Cl. F16h *1/44*
U.S. Cl. 74—711 **5 Claims**



A limited slip differential mechanism having preloaded conical friction members which retard differential action. The mechanism includes camming means operable independently of the mechanism side gears to proportionally decrease friction preload force on the conical friction members in response to increasing input torque.

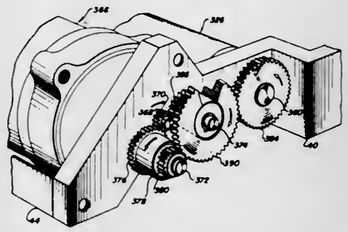
3,580,109
PLANETARY-GEAR TRANSMISSION WITH INTERCONNECTED SUN GEARS AND RING GEARS
Franz Hill, Friedrichshafen, Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany
Filed Sept. 4, 1969, Ser. No. 855,137
Claims priority, application Germany, Sept. 6, 1968, Z12082
Int. Cl. F16h *5/30*
U.S. Cl. 74—763 **4 Claims**

An automotive transmission with two cascaded planetary gear trains has the two ring gears rigidly connected with each other and with the output shaft, the input shaft being alternately connectable with one planet carrier (forward) or with the two interconnected sun gears (reverse). The driven



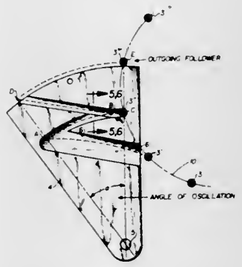
planet carrier supports two sets of intermeshing planet gears to invert the sense of output-shaft rotation in first and second gear.

3,580,110
TWO SPEED DRIVE MECHANISM FOR FACSIMILE RECORDING SYSTEM OR THE LIKE
Frans Brouwer, Glencoe, and Frank L. Sobchak, Chicago, Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.
Division of Ser. No. 613,545, Feb. 2, 1967, Pat. No. 3,527,882.
Filed Dec. 1, 1969, Ser. No. 881,054
Int. Cl. F16h *5/52*
U.S. Cl. 74—812 **4 Claims**



A facsimile device including a two speed drive mechanism for driving the recording medium. The mechanism includes a reversible motor and a gearing means to drive the medium at one speed in a forward direction when the motor is operated in one direction and at a different speed in the forward direction when the motor is operated in the opposite direction.

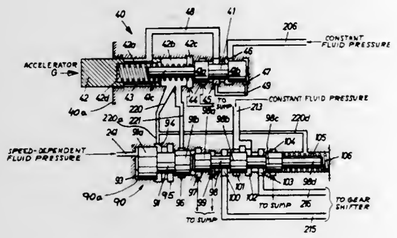
3,580,111
CAM-CONTROLLED INDEXING DEVICE
Joseph M. Tyrner, Brookside, N.J., assignor to Allied Chemical Corporation, New York, N.Y.
Filed Apr. 23, 1969, Ser. No. 818,607
Int. Cl. B23b *29/00*
U.S. Cl. 74—817 **6 Claims**



This application relates to cam-controlled indexing devices. The subject indexing device includes a rotatable in-

dexing wheel perpendicularly mounted on a driven shaft and having cam rollers thereon equispaced alternately on opposite sides of said wheel at a constant radial distance from said driven shaft. The indexing wheel is driven by a cam drive comprising as oscillating sector cam having a groove therein and pivotably mounted adjacent said indexing wheel and for irreversible serial engagement with said cam rollers.

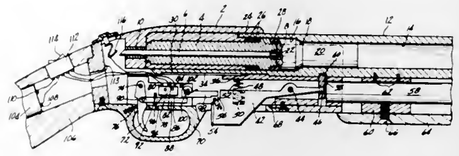
3,580,112
AUTOMATIC GEAR-SHIFT CONTROL FOR AUTOMOTIVE TRANSMISSION SYSTEM
Hansjorg Dach, Friedrichshafen, Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany
Filed Apr. 21, 1969, Ser. No. 817,984
Claims priority, application Germany, Apr. 20, 1968, P 17 55 282.8
Int. Cl. B60k *21/08*
U.S. Cl. 74—868 **9 Claims**



A throttle valve 40 connected to a supply of hydraulic fluid delivers a variable fluid pressure dependent on the engine load of an automotive vehicle whose accelerator controls a plunger 42 which, through the intermediary of a compression spring 43, resists the displacement of the body 41 of that valve in response to the supply pressure. In a retracted or partly depressed position of the accelerator, the plunger 42 blocks the transmission of the load-dependent fluid pressure via a first conduit 220 to an automatic switching device 90 having a control piston 91 acted upon by speed-dependent fluid pressure and biased by a countervailing spring 105 into a normal, low-speed position. In the absence of supplemental fluid pressure from the throttle valve 40, the control piston 91 together with an associated slider 98 is moved into an off-normal, high-speed position whenever the speed-dependent fluid pressure overcomes the force of the biasing spring 105; with the accelerator in a position approaching full throttle, i.e. beyond a predetermined load threshold, the biasing force is supplemented by the load-dependent fluid pressure so that upshifting occurs at higher drive shaft speeds only. The load-dependent fluid pressure is applied in aiding relationship via two branch conduits 220*a*, 220*d* to a face of the piston and to another face on the slider, the first branch conduit 220*a* being obstructed in the off-normal piston position so as to create a hysteresis effect whereby under unchanged load conditions the downshift takes place at a lower speed than the upshift. Another conduit 221, unblocked by the plunger 42 in a kick-down position of the accelerator, partly cancels the aforementioned hysteresis effect whereby downshift under maximum load occurs at a higher speed.

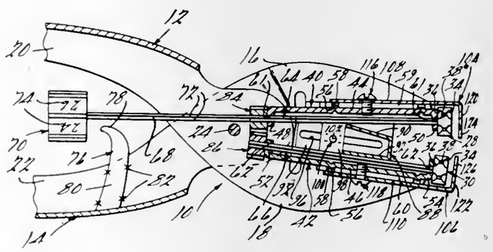
3,580,113
ELECTRICAL IGNITION FIREARM, WITH A FORWARDLY SLIDING BARREL
Marcus Ramsay, New Haven, Conn., and Arthur W. Lilley, Pittsburgh, Pa., assignors to Olin Corporation
Filed Sept. 12, 1969, Ser. No. 857,366
Int. Cl. F41c *19/12;* **F41f** *13/08*
U.S. Cl. 42—84 **9 Claims**

A firearm for electrically firing caseless ammunition having no primer. A switch is actuated by the trigger to permit passage of current from a capacitor to an electrode contacting the ammunition. Elapsed time between trigger pull and firing of the ammunition is decreased as compared to impact



ignition firearms. The gun is prevented from firing unless the action is locked in its battery position.

3,580,114
WIRE-STRIPPING APPARATUS
Walter J. Rozmus, Hubbardsville, N.Y., assignor to Utica Tool Company, Inc., Orangeburg, S.C.
Filed June 6, 1968, Ser. No. 734,984
Int. Cl. H02g *1/12*
U.S. Cl. 81—9.5 **27 Claims**

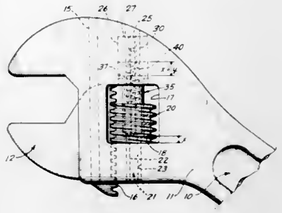


An apparatus for removing or stripping the insulation from a wire and comprising a pair of plierslike lever members pivotably connected to one another and defining engageable jaw sections and manually grippable handle sections; a pair of rotatable stripper members mounted one on each of the jaw sections with each stripper member comprising a plurality of stripping elements; the elements on one of the stripper members corresponding to and adapted to be operatively associated with the stripping elements on the other stripper member; shaft means rotatably supporting the stripper members and means for effecting simultaneous rotation of the shaft means and stripper members thereon, whereby corresponding stripping elements may be moved into confronting cooperable relation; spring means for resiliently urging the jaw sections apart and for providing an audible signal in response to preselected rotational movement of the shaft means, and guide means on the forward ends of the jaw sections for guiding the wire from which insulation is to be stripped during relative axial movement of the wire with respect to the stripping apparatus.

3,580,115
WRENCH HAVING A LOCKED ADJUSTABLE POSITION
Harry W. Thompson, 8007 S. Chappel Ave., Chicago, Ill.
Filed July 24, 1969, Ser. No. 844,571
Int. Cl. B25b *13/16*
U.S. Cl. 81—165 **6 Claims**

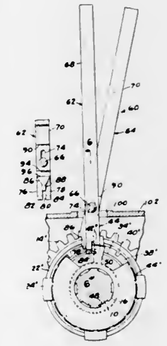
An adjustment wrench is afforded in which the adjusted

position is locked by a worm nut held in engagement, by a coil spring, with a nonrotatable key. The gear thread on the



nut, when turned, will adjust the movable jaw when the nut is unseated from the key.

3,580,116
CLUTCH ADJUSTMENT TOOL
Janis Tenisons, Edwardsburg, Mich., assignor to Tecumseh Products Company, Tecumseh, Mich.
Filed June 13, 1968, Ser. No. 736,717
Int. Cl. B25b *7/00*
U.S. Cl. 81—302 **5 Claims**



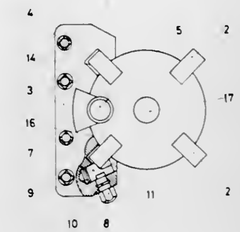
A plierslike device with a pair of arms interconnected for movement relative to one another for manipulating a wear takeup nut and an associated spring detent in a friction clutch so that the detent may be readily released and the nut readily adjusted manually at a mechanical advantage provided by the tool and from outside the clutch housing. The working end of one arm of the tool has a slot between chisel point faces to pry out and hold the detent, and the working end of the other arm has a narrow projection or tongue to engage the notched periphery of the nut. Both ends of the tongue arm are offset with respect to the chisel point arm so that the arms do not interfere when they are pivoted past each other.

ERRATUM

For Class 82—2 see:
Patent No. 3,580,129

3,580,117
TOOL CARRIER ASSEMBLY FOR A LATHE OR OTHER MACHINE TOOL
Stefan Sarzinski, Sarajevo, Yugoslavia, assignor to "Zrak"-Preduzece Precizne mehanike i optike, Sarajevo, Yugoslavia
Filed Feb. 27, 1969, Ser. No. 802,893
Claims priority, application Yugoslavia, Apr. 25, 1968, P-989/68
Int. Cl. B23b *29/00;* **B26d** *1/12*
U.S. Cl. 82—36 **8 Claims**

According to the present invention, there is provided a tool carrier assembly for a lathe or other machine tool, such assembly comprising a substantially circular body, a removable tool carrier having means to clamp a tool thereto, and a circular concave surface adapted to a cooperate with the outer surface of the body, at least two axially extending, cir-



cumferentially spaced apart, interengageably keys and grooves being formed on the circular surfaces of the body and tool carrier and means to cause relative movement between one of the grooves and its associated key to secure the tool carrier to the body.

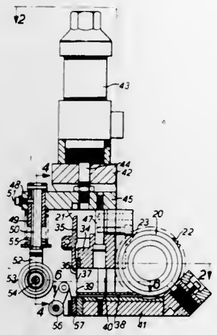
3,580,118
MACHINE TOOL CUT-OFF SLIDE
Jack A. Hazel, Northolt, England, assignor to C.A.V. Limited, Warple Way, Acton, London, England
Filed Nov. 19, 1968, Ser. No. 776,897
Int. Cl. B23b *5/14*
U.S. Cl. 82—46 **5 Claims**

A machine tool for use when parting off a component from a barstock using a parting off tool and comprising a pusher member engageable with the component and arranged to apply a lateral force to the component to shear the component from the barstock when the parting off tool has machined to a predetermined depth the bridge of material forming the connection between the component and the barstock.

3,580,119
MAINTAINING SHEETS OF GLASS IN MUTUALLY SPACED RELATIONSHIP WHEN STACKED TOGETHER FOR TRANSPORT OR STORAGE
Geoffrey Frank Witherington-Perkins, Redditch, England, assignor to Triplex Safety Glass Company Limited, London, England
Filed Jan. 31, 1969, Ser. No. 795,579
Claims priority, application Great Britain, Jan. 31, 1968, 4,902/68
Int. Cl. B26d *5/22*
U.S. Cl. 83—23 **6 Claims**

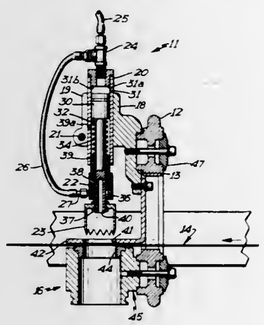
A method and apparatus for maintaining sheets of glass in mutually spaced relation when stacked together. Flexible strip material is fed to a severing machine wherein strips are cut to length. Thereafter the cut strips are applied to sheets

of glass before the glass sheets are stacked together. One face of the strip material is smoother than the other face whereby



the smoother face tends to adhere to the glass more strongly than the less smooth face.

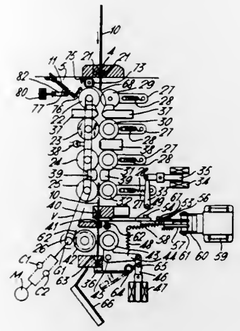
3,580,120
MULTIPURPOSE PUNCH
Richard C. Adams, West Barrington, R.I.; William S. Coombes, Somerset, and Domenic Lerardo, Walpole, Mass., assignors to G. T. Schjeldahl Company, Northfield, Minn.
Filed Nov. 5, 1968, Ser. No. 773,612
Int. Cl. B26d *7/18*
U.S. Cl. 83—98 **7 Claims**



Punching apparatus particularly adapted for use in connection with flexible film materials including a punching assembly and a die assembly arranged in aligned relation with the punching assembly, means for reciprocably shifting the punch into engagement with the die for performing a cutting operation on film disposed between the punch and the die, and including means for injecting a pulse of compressed gaseous fluid when the punch is in its extended disposition. Bores are formed within the punching apparatus to permit coupling of a source of gaseous fluid under pressure to the punching assembly for discharge from the surface of the punch member, the arrangement being such that gaseous fluid under pressure is discharged from the punch only when the punch member is in its extended position.

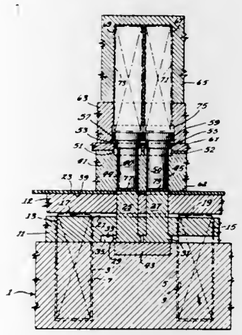
3,580,121
APPARATUS FOR CHECKING A TICKET
Takeo Asada, and Toshihiro Kamiya, Kyoto-fu, Japan, assignors to Omron Tateisi Electronics Co., Kyoto-fu, Japan
Filed Feb. 27, 1969, Ser. No. 802,965
Claims priority, application Japan, Mar. 6, 1968, 43/14426
Int. Cl. B65h *43/00;* **B26d** *5/32*
U.S. Cl. 83—107 **8 Claims**

An apparatus for checking a ticket and more particularly a device for checking tickets such as an admission ticket for a theater and the like, which is capable of cutting a ticket into two halves after checking it, collecting one half in the ap-



paratus and returning the other half to the original user of the ticket from the outlet slot on the apparatus.

3,580,122
APPARATUS FOR MAKING KNOCKOUTS IN ELECTRICAL BOXES FORMED OF PLASTIC MATERIAL
James C. Powell, Elkhart, Ind., assignor to All-Steel Equipment Inc.
Filed Dec. 13, 1968, Ser. No. 783,584
Int. Cl. B26d *7/18;* **B26f** *1/14*
U.S. Cl. 83—108 **16 Claims**

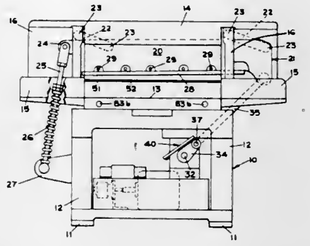


Knockouts are formed in electrical fixtures, such as connector boxes made of plastic sheet material, by punching the knockouts from plastic sheet or blanks prior to shaping into the fixture or by shaping the fixture and then punching out the knockouts. By resiliently supporting the material surrounding the knockout area on the punch side and resiliently biasing a knockout stripper against the surface of the knockout opposite that contacted by the punch, knockouts can be punched out and replaced in the material in a single operation if the opposite biasing forces of the support and knockout stripper are properly correlated.

3,580,123
CUTTER
Dan P. Westra, and John J. Siewert, Grand Haven, Mich., assignors to The Challenge Machinery Company, Grand Haven, Mich.
Filed June 13, 1968, Ser. No. 736,808
Int. Cl. B26d *5/42, 5/16*
U.S. Cl. 83—380 **14 Claims**

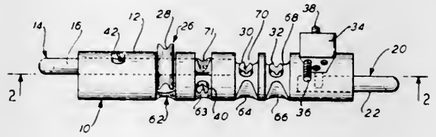
A cutter adapted particularly for cutting paper stock including a clamping mechanism and a knife member. The

knife member is reciprocated into and out of abutment with the paper-supporting table by means of an eccentric arm and a connecting rod. The eccentric arm is rotated by means of a hydraulic actuator, the actuator being reversible such that it runs in opposite directions depending upon whether the knife



is being raised from the table or lowered into abutment therewith. Suitable safety stops are provided for limiting the movement of the eccentric member in the event of failure of one of the controls therefor. The arm is positioned overcenter when the knife is in its raised position.

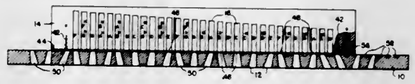
3,580,124
NOVEL PITCH ADJUSTMENT MEANS FOR STRINGED INSTRUMENTS
John Mancini, Roselle, N.J. (215 S.E. Third Ave. Apt. 107 D Hallandale, Fla. 33009)
Filed Apr. 13, 1970, Ser. No. 27,622
Int. Cl. G10d *3/00*
U.S. Cl. 84—313 **21 Claims**



There is provided a simple and novel device principally intended for use with a double bass or similar instrument, whereby the pitch of one string may be adjusted in a precise, predictable and reversible manner to a pitch other than that at which it is normally played. The device comprises a cylinder having a pulley mounted therein whose axis is parallel to but eccentric in relation to the principal axis of the cylinder. The device further optionally comprises excisions having adjustable plugs therein for the minor and, reversable, adjustment of the pitch of the other strings, means for rotating the cylinder into a "contact" and "noncontact" position wherein the string of the instrument to be adjusted in pitch either is in contact or is not in contact respectively with the pulley. The device further optionally comprises a means for controlling the degree of rotation of the device between the "contact" and "noncontact" positions.

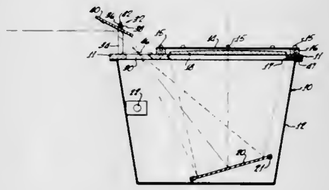
3,580,125
KEY-ADJUSTABLE HARMONICA
Oliver W. Heatwole, 3900 16th St. N.W., Washington, D.C.
Filed Apr. 4, 1969, Ser. No. 813,463
Int. Cl. G10d *7/12*
U.S. Cl. 84—377 **28 Claims**

A key-adjustable harmonica for selectively playing in any one of a plurality of musical keys by the use of seven consecutive blowholes per octave without the necessity for readjusting the harmonica to obtain the proper notes in the key. The harmonica includes means for selectively connecting all of the seven blowholes per octave with only those reed cells of chromatically arranged cells containing reeds tuned to the notes of the selected key while blocking off those cells not in the selected key. In addition, the arrangement provides



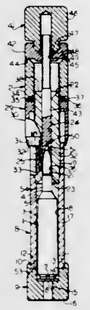
means of access to a given reed in a plurality of adjustments of the harmonica. Any note can be played by either blowing or drawing at will.

3,580,126
LIGHT DISPLAY INSTRUMENT
John F. Forkner, 2670 Solana Way, Laguna Beach, Calif.
Filed Oct. 29, 1968, Ser. No. 771,479
Int. Cl. A63j *17/00*
U.S. Cl. 84—464 **19 Claims**



A device for producing esthetically pleasing patterns of light which is controllable like a musical instrument. The device includes an elastically stretchable reflective mirror surface which is spaced from a high intensity light source. A collimating and focusing lens is interposed between the reflective surface and the light source so that light beams emanating from said light source and reflected from said reflective surface are focused st a point within an aperture defined in the cabinet of the device. A dynamic image display may be produced by applying localized pressures to the reflective surface thereby distorting the reflected pattern. These localized forces may be applied by sound waves, manual pressure and the like. Further interesting effects are obtainable by varying the optical characteristics of the light beams as they pass through the focal point as by the use of light filters or masks.

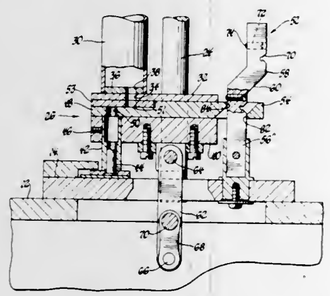
3,580,127
CARTRIDGE CASE RELOADING
Richard J. Lee, R.R. 2, Hartford, Wis.
Filed Aug. 19, 1968, Ser. No. 753,461
Int. Cl. F42b *33/10, 35/02*
U.S. Cl. 86—24 **8 Claims**



In apparatus for reloading used center-firing cartridge cases, a resizing sleeve having a bore therein of which the

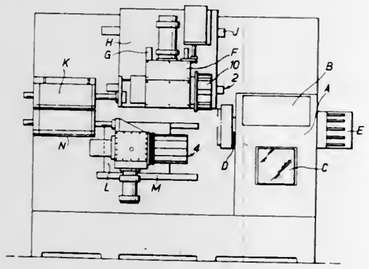
upper portion is cylindrical and the lower portion is tapered to wedgingly receive the neck of a cartridge case driven upwardly therein to resize and reform the neck and to hold the neck in a reaming position therein; a reamer adapted for reaming the interior of the neck to obtain uniform neck wall thickness; a bullet-seating gauge threadably mounted on the projecting above the resizing sleeve and micrometrically alignable on the shell guide to reveal the distance which the bullet-seating gauge projects above the resizing sleeve; an elongated bullet seater adapted to engage and force a bullet downwardly a predetermined distance into a seated position within the neck while the neck is partially within the tapered lowered portion of the bore in a bullet-seating position; and means for positioning the neck in the bullet-seating position.

3,580,128
AMMUNITION RELOADER
Robert A. Leich, Southfield, Mich., assignor to Camdex, Inc., Detroit, Mich.
Filed Sept. 4, 1969, Ser. No. 855,149
Int. Cl. F42b *33/02*
U.S. Cl. 86—31 **22 Claims**



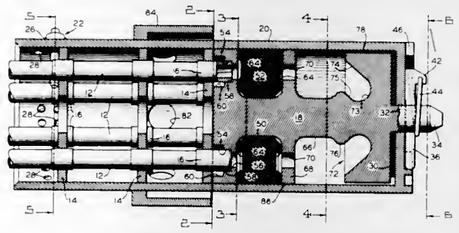
An automatic powder metering apparatus for loading ammunition including a powder slide, a cam for cyclically displacing the slide between a powder input position and a powder output position and means on the cam for cyclically pulsating the slide when in the two above-named positions to loosen the powder for correct feeding.

3,580,129
PRESETTABLE TOOL ARRANGEMENTS FOR MACHINE TOOLS
Eric R. Austin, Coventry, and Eric G. Bill, Solihull, England, assignors to B.S.A. Tools Limited, Birmingham, England
Filed Aug. 30, 1968, Ser. No. 756,458
Claims priority, application Great Britain, Sept. 1, 1967, 40086/67
Int. Cl. B23b *3/00*
U.S. Cl. 82—2 **2 Claims**



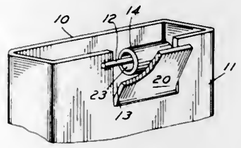
A presettable tool arrangement incorporates a tool holder with a dovetail slide portion for slidably engaging a dovetail guideway on a tool mount. An adjustable abutment rod on the tool holder engages an abutment on the tool mount for accurately positioning the preset tool holder on the tool mount.

3,580,130
BULLET TRAP ATTACHMENT FOR MACHINE GUNS
Paul W. Arvidson, Princeton, Iowa; William G. Park, Silvis, Ill., and Keith S. Williams, Davenport, Iowa assignors to The United States of America as represented by the Secretary of the Army
Filed Sept. 29, 1969, Ser. No. 861,691
Int. Cl. F41f *17/00;* **F41j** *1/12*
U.S. Cl. 89—31 **8 Claims**



The safe trapping of one or more bullets fired from a Gatling-type machine gun is accomplished by an attachment releasably secured to the muzzle end of the barrel cluster and provided with an interior chamber containing an elastomeric material at the rear end thereof capable of being penetrated by those bullets existing from the barrels and immediately recovering thereafter to seal any discharge gases then in the chamber, the forward wall of the chamber forming an impact surface against which the forward velocity of each bullet is terminated by the shattering thereof into discrete particles.

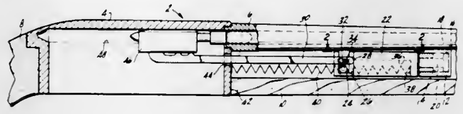
3,580,131
ANTIFEEDBACK DEVICE
John R. Zimmerman, Sterling Heights, Mich., assignor to the United States of America as represented by the Secretary of the Army
Filed Oct. 20, 1969, Ser. No. 867,614
Int. Cl. F41d *9/02*
U.S. Cl. 89—34 **4 Claims**



A simplified antifeedback device for installation in vertically fed belt-type ammunition supply systems is disclosed. The device comprises a tube mounted in a cutaway portion of the feed guide in such a manner that it is moved up and out of the way as the ammunition belt advances, but lodges itself between links of the ammunition belt and the cutaway portion of the feed guide when the belt is drawn downward by gravity upon the cessation of ammunition feed.

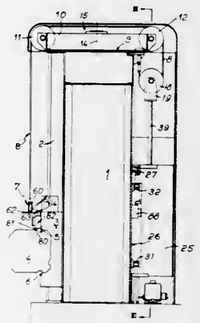
3,580,132
BUFFER AND DELAY MECHANISM FOR A FIREARM
Edwin S. Vartanian, North Haven, Conn., assignor to Olin Mathieson Chemical Corporation
Filed Sept. 25, 1968, Ser. No. 762,593
Int. Cl. F41d *5/04, 11/12*
U.S. Cl. 89—130 **7 Claims**

A mechanism for reducing the recoil force caused by reciprocation of a bolt assembly in a semiautomatic firearm, and for delaying the return of the bolt assembly from its retired position to its battery position. A slide block is mounted for reciprocation adjacent to the barrel, and the bolt assembly is mounted for reciprocation within the receiver. A pair of slide arms are secured to the bolt assembly and extend toward the slide block, normally abutting the latter. A spring engages the slide block to decelerate the latter during rearward reciprocation thereof. The slide block



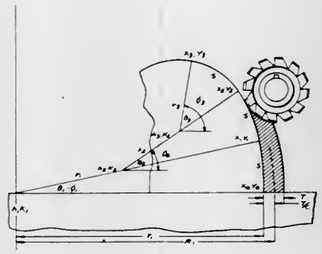
thus decelerates during its rearward stroke while the bolt assembly and slide arms are thus free to move away from the slide block to strike the rear of the receiver and rebound forwardly therefrom. After rebound, the slide arms and bolt assembly strike the rearwardly moving slide block to cause a pause in the reciprocation cycle, after which pause the slide block, slide arms, and bolt assembly all move forward to their original positions under the influence of the spring.

3,580,133
BALANCE COMPENSATING DEVICE
Charles William Berthiez, 5, Avenue Eglantine, Lausanne, Switzerland
Filed May 1, 1969, Ser. No. 820,943
Claims priority, application France, May 3, 1968, 150,473
Int. Cl. B23c *1/02*
U.S. Cl. 90—11 **12 Claims**



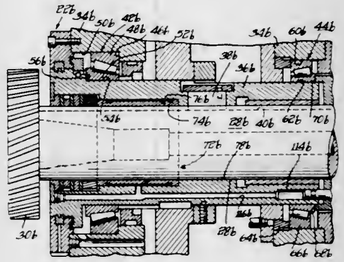
A milling and boring machine having an upright with a front face and a rear face and pulleys slideways on the front face, a saddle mounted for sliding movement on the vertical slideway, the saddle having horizontal slideways on which is mounted a headstock adapted for sliding movement with respect to the saddle. The machine tool is provided with a counterweight for the headstock to balance the horizontal movements of the latter which is fixed in the vertical direction. The balancing means includes a horizontal beam mounted on the upright adapted for pivotal movements around a vertical axis so that one end of the beam constantly hangs over the headstock. A loose pulley is mounted at each end of the beam and flexible extension means pass over both pulleys and connect the headstock to the counterweight on the rear face of the upright. A hydraulic takeup means is provided for the flexible suspension means which is adapted to maintain counterforces between the counterweight and the headstock.

3,580,134
MACHINING METHOD
Edwin C. Harrington, Jr., Wilbraham, Mass., assignor to Monsanto Company, St. Louis, Mo.
Filed Oct. 21, 1968, Ser. No. 769,342
Int. Cl. B23c *1/16*
U.S. Cl. 90—13C **3 Claims**



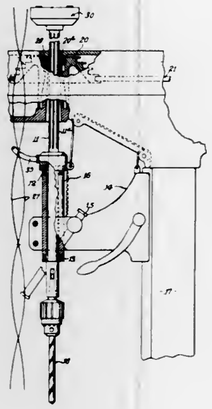
A method for cutting a curved surface on one face of a workpiece so as to produce a longitudinal curveature thereon such that when a specimen in planar sheet form is placed in face-to-face engagement with the resulting curved surface, the strain on the outer surface of such specimen varies linearly with distance along the surface of such specimen.

3,580,135
CLAMPING APPARATUS FOR A MACHINE TOOL
Gordon H. Jones, Van Dyne, Wis., assignor to Giddings & Lewis, Inc., Fond du Lac, Wis.
Continuation-in-part of application Ser. No. 744,458, July 12, 1968, now Patent No. 3,540,346. This application Sept. 3, 1969, Ser. No. 854,998
Int. Cl. B23c *1/02*
U.S. Cl. 90—11A **14 Claims**



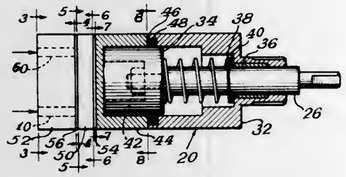
A machine tool having a longitudinally adjustable machining spindle carried by a rotary spindle sleeve and securely clamped releasably within the sleeve by a clamping bushing encircling the spindle. The clamping bushing is force fitted within the encircling structure of the sleeve so that residual compressive stresses are established. The sleeve and clamping bushing define an elongate, annular chamber, cylindrical in nature, which is disposed intermediate the ends of said bushing and sealed to render same a fluid chamber. Fluid pressure means are associated with said chamber to provide fluid under pressure, whereby said clamping bushing is restricted circumferentially to effect hard compressive contact with a machine tool spindle. The clamping arrangement utilizes a relatively thick, stiff clamping bushing structure in conjunction with a plenum chamber that is extremely narrow in section, whereby numerous advantages over prior clamps are attained.

3,580,136
SONIC ENERGY IN MACHINING OPERATIONS
Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif.
Filed Dec. 9, 1968, Ser. No. 782,347
Int. Cl. B23d *39/00;* **B23b** *47/34;* **B23c** *1/00*
U.S. Cl. 90—64 **7 Claims**



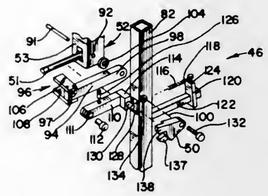
A machine tool such as a drill has a stem of elastic material to which the cutting tool is attached. Supported on this stem is an orbiting-mass oscillator. While a machining operation is being performed, the orbiting-mass oscillator is driven at a frequency such as to resonantly elastically vibrate the stem, thereby providing sonic energy to the cutting tool which effectively pulverizes the cuttings made by the cutting tool so that they will not impede the machining operation.

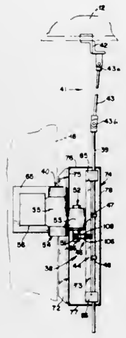
3,580,137
FLUID PROXIMITY SENSOR AND DRIVE MECHANISM TO CONTROL DISTANCE OF AN OBJECT FROM THE SENSOR
Karl A. Brandenberg, Hayward, Calif., assignor to The Aro Corporation, Bryan, Ohio
Filed Sept. 20, 1968, Ser. No. 761,238
Int. Cl. F15b *11/15;* **F01l** *15/04, 25/06*
U.S. Cl. 91—50 **12 Claims**



A unipressure fluid logic control and power supply device which utilizes a single air pressure source for sensing and indicating the proximity or gap between a sensor and a driven element. The same supply means provides power to an air motor which drives the driven member and maintains it in a desired position in relation to the proximity sensor. The sensing device includes a fluid oscillator adapted to drive the piston-type air motor and an air inhibitor which prevents the oscillator from operating whenever a sensed fluid signal indicates the proximity or position of the driven member is as desired.

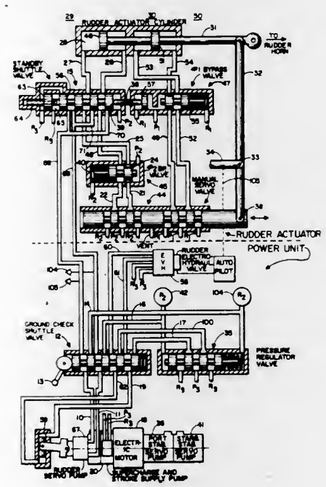
3,580,138
VALVE OPERATING MECHANISM
Gunter Maasshoff, Glenview, Ill., assignor to Hawk Oil Field Equipment Corp., Evanston, Ill.
Filed July 28, 1969, Ser. No. 845,423
Int. Cl. F01l *25/06, 31/02*
U.S. Cl. 91—277 **14 Claims**





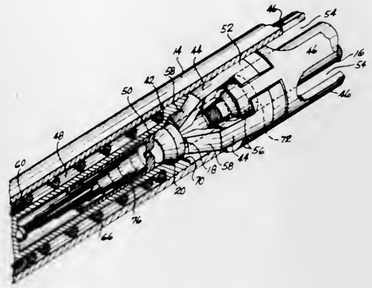
A spring biased swing arm is operatively associated with a control arm of a valve assembly for moving the arm to quickly control the flow of fluid to a reciprocating hydraulic operating mechanism in a well pumping apparatus. The swing arm is moved with a snap action by a spring when a tripping block engages and moves a pivotally mounted toggle actuator which moves the spring over center to cause quick movement of the control arm to one of its operative positions.

3,580,139
CONTROL APPARATUS
Robert F. Rasmussen, Brooklyn Center, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Apr. 3, 1969, Ser. No. 813,018
Int. Cl. F15b *18/00;* **B64c** *13/42*
U.S. Cl. 91—411 **11 Claims**



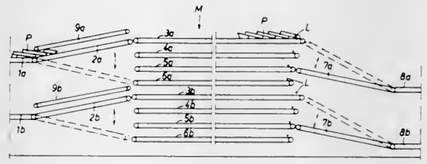
Conventionally, in aircraft having fluid operated servomotors for positioning the control surfaces, aircraft engine driven pumps supply the operating fluid pressures for the servomotors while the aircraft is in flight.

3,580,140
LOCKING MECHANISM FOR FLUID TYPE ACTUATORS
William H. Walker, 2210 104th S.E., Bellevue, Wash.
Filed Dec. 9, 1968, Ser. No. 782,290
Int. Cl. F15b *15/26*
U.S. Cl. 92—25 **7 Claims**



A device mounted to the piston of a hydraulic actuator to mechanically lock the piston in its retracted position. The piston carries several locking segments which, with the piston retracted, reach inwardly to engage the head of a locking stud that is fixed to the cylinder. When hydraulic fluid is fed into the cylinder so as to extend the actuator, the hydraulic pressure first pushes back a locking piston (located within the main piston) which positively moves the locking segments out of engagement with the locking stud, and then the main piston moves to its extended position. With no hydraulic pressure acting to extend the main piston, the segments lock the piston in its retracted position.

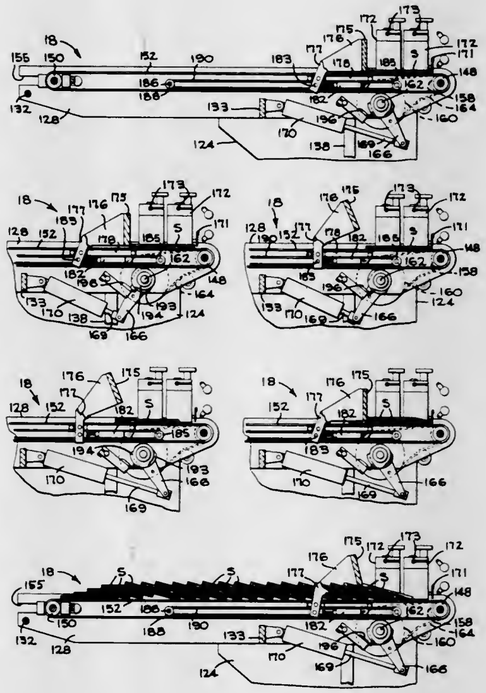
3,580,141
APPARATUS FOR PAPER SACKS MANUFACTURE
Herbert Richter, Beckum, Germany, assignor to Windmoller & Holscher, Lengerich, Germany
Filed Aug. 21, 1968, Ser. No. 754,247
Claims priority, application Germany, Aug. 28, 1967, H60025
Int. Cl. B31b *1/00*
U.S. Cl. 93—8 **5 Claims**



A system of multiple conveyor belts designed to maintain a balance between the output of a tube-forming machine and a bottom-folding machine used in the manufacture of paper, plastic or similar sacks, in which an assemblage of conveyor belts having sufficient capacity for the piles of tubes produced by the tube-former acts as a magazine upon which the bottom-folder draws as required. Pivoting conveyor belts, directed by suitable monitoring devices, maintain a steady flow into and out of the magazine.

3,580,142
BAG STACK ACCUMULATING CONVEYOR
David K. Stock, and Robert J. Wech, Green Bay, Wis., assignors to FMC Corporation, San Jose, Calif.
Filed May 5, 1969, Ser. No. 821,754
Int. Cl. B31b *1/14, 1/64, 1/98*
U.S. Cl. 93—33 **12 Claims**

A machine produces bags from thermoplastic web by intermittently feeding and severing the web with a heated reciprocating seal bar. The time interval between two seal bar reciprocations represents a bag making cycle and the number of bag making cycles per minute is the production rate of the machine. Bags produced by the machine are discharged between stacking guides that constrain the bags to fall into a neatly registered stack on an index conveyor at the cyclical rate of bag production. When a predetermined bag count per stack is reached, bag production is interrupted for a period known as an interrupt cycle, during which the index

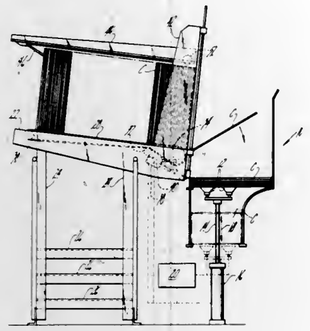


conveyor moves the stack of bags, relative to the stacking guides, at a rate independently of the bag making cycle. Upon resumption of bag production, a second stack of bags is formed in shinglelike fashion relative to the first stack and the operation is repeated. Since indexing is performed during an interrupt cycle which is independent of the bag making cycle, the production rate of the machine can be increased to a maximum by using a bag making cycle that is less than an indexing time interval.

3,580,143
MAGAZINE CONSTRUCTION FOR PACKING CASE ERECTING MACHINE
Daniel McIntyre, Portland, Conn., assignor to Emhart Corporation, Bloomfield, Conn.
Filed Apr. 22, 1968, Ser. No. 722,943
Int. Cl. B31b *1/06, 1/78, 1/94*
U.S. Cl. 93—53 **10 Claims**

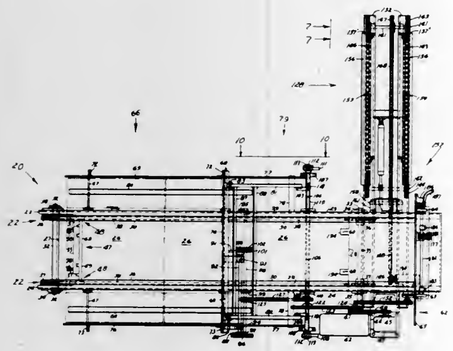
A secondary case magazine is provided above and to one side of an upwardly open primary case magazine from which the lowermost case is cyclically withdrawn for erection. The secondary magazine is disposed generally horizontally, and holds a large number of cases in generally vertical edgewise relation. Escapement means at the exit end of the secondary magazine successively ejects each case for downward movement onto the stack of cases in the primary magazine. Means

in the secondary magazine urges all of the cases therein toward said exit end, and said means operates in timed rela-



tionship with said escapement means and said means for withdrawing the lowermost case from the primary magazine.

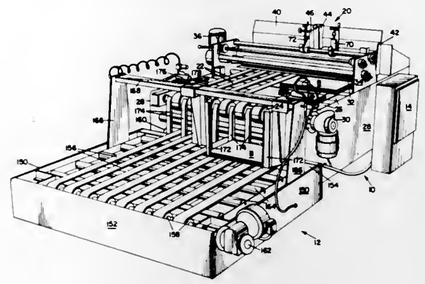
3,580,144
APPARATUS FOR ERECTING AND FORMING INITIALLY COLLAPSED CARTONS INTO CONTAINERS
John J. Renard, 1541 Harold St., Green Bay, Wis.
Filed Dec. 31, 1968, Ser. No. 788,181
Int. Cl. B31b *1/78, 5/26, 1/94*
U.S. Cl. 93—53AC **7 Claims**



A folded case opener apparatus including a flap depressor periodically actuated downwardly to allow a cooperating pivotal hooked arm to engage the advancing laterally disposed edge of an adjacent nondepressed flap thereby to raise said flap and erect such advancing folded case.

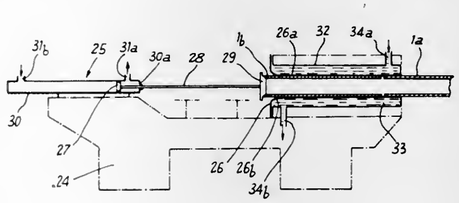
3,580,145
COUNTING APPARATUS
Roy E. Vermes, Wilbraham, Mass., assignor to Revco Inc., Agawam, Mass.
Filed Jan. 16, 1969, Ser. No. 791,595
Int. Cl. B31b *1/96, 1/98;* **B65b** *57/20*
U.S. Cl. 93—93 **1 Claim**

A machine for accumulating carton blanks into in-seriatim-formed stacks of blanks of predetermined count and delivering the counted stacks as uniformly aligned units of blanks to a delivery station at one end of the machine, the machine comprising: a hopper for supporting a supply of the blanks to be counted, kicker means cooperant with the hopper for the in-seriatim ejecting of bundles of counted blanks from the hopper, an accumulator-aligner for accumulating and aligning a predetermined number of such bundles to form a stack, intermittently openable gate means cooperant with the accumulator-aligner and operably into gate opening position as a predetermined number of bundles in the stack has been attained, first conveyor means for conveying the stack



delivered from the hopper by the kicker means to the accumulator-aligner, and second conveyor means for removing the stacks from the accumulator-aligner as the gate means is opened for delivery of the stack to a delivery station at one end of the apparatus.

3,580,146
METHOD OF MAKING ACCURATELY DIMENSIONED SMOOTH-SURFACED MULTI-LAYER CARDBOARD TUBES
Joseph Biancamaria, Ivry sur Seine, France, assignor to L'-Homme (Societe Anonyme), Paris, France
Filed Feb. 7, 1969, Ser. No. 797,487
Claims priority, application France, Feb. 7, 1968, PV 139 051
Int. Cl. B31c *3/04, 11/04;* **B31b** *1/64*
U.S. Cl. 93—94 **10 Claims**

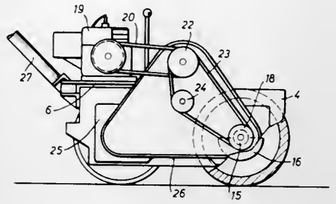


In order to obtain helically wound multilayer cardboard tubes of accurate diameter and very smooth external surface, the tubes are coated with a thermosetting resin and forced through the bore of a heated jacket to cause (1) curing of the resin and (2) reduction of the tube diameter to the precise desired dimensions. This reduction is taken up by a radially compressible layer of the tube.

3,580,147
VIBRATORY ROAD ROLLER
Benno Kaltenegger, Kurhausstrasse 73—79, 5202 Hennef Sieg, Germany
Filed Aug. 9, 1968, Ser. No. 751,429
Claims priority, application Germany, Aug. 25, 1967, K63208
Int. Cl. E01c *19/24*
U.S. Cl. 94—50 **16 Claims**

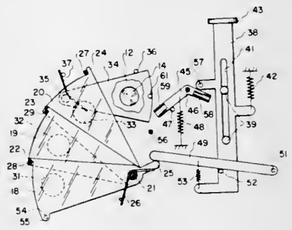
This provides a vibratory road roller having at least two driven roller drums lying one behind the other in the direction of travel. The drums are carried by a rigid frame.

The drums which are placed one behind the other are of different weights. In one embodiment of the invention the roller



drums are also of different lengths. At least one of the roller drums has a vibration shaft which carries eccentric weights.

3,580,148
PHOTOCHROMIC EXPOSURE CONTROL
Donald M. Harvey, Webster, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Aug. 1, 1969, Ser. No. 846,817
Int. Cl. G03b *9/02, 11/00;* **G02b** *5/20*
U.S. Cl. 95—10 **10 Claims**

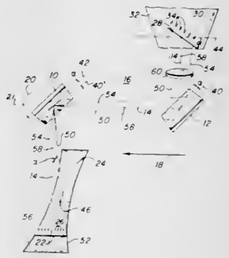


An exposure control system in a camera includes a plurality of transparent photochromic elements that darken as a function of the illumination intensity to which they are exposed. The elements are exposed separately to scene illumination and are then superimposed in alignment with the camera lens and shutter just before the shutter is operated to effect film exposure.

3,580,149
FILTER CORRECTION DEVICE
Shin Fujisawa, Kanagawa, Japan, assignor to Fuji Shashin Film Kabushiki Kaisha, Kanagawa, Japan
Filed Oct. 23, 1967, Ser. No. 677,347
Claims priority, application Japan, Oct. 26, 1966, 41/70217
Int. Cl. G03b *19/00*
U.S. Cl. 95—11 **4 Claims**

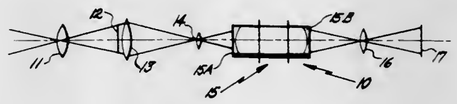
A filter correction device including a pair of filters of different spectral characteristics, each filter of which is moved in and out of alignment with the optical axis of the camera lens system automatically by an electric motor responsive to closure of the normally open switch to achieve color correction in accordance with the spectral characteristics of the illuminated object to be photographed.

3,580,150
PANORAMIC CAMERA WITH FORWARD IMAGE MOTION COMPENSATION BY OPTICAL ROTATION OF IMAGE
John Thaxter Watson, Wellesley Hills, and Kenneth Robinson, Needham, Mass., assignors to Itek Corporation, Lexington, Mass.
Filed Apr. 15, 1968, Ser. No. 721,227
Int. Cl. G03b *29/00*
U.S. Cl. 95—12.5 **5 Claims**



Apparatus for compensating for forward image motion in panoramic cameras by rotating the image about the optic axis of the camera. In an aircraft camera a first scanning mirror is rotated relative to a second scanning mirror about their common axis in order to provide compensation for the forward motion of the plane.

3,580,151
LOW LIGHT LEVEL COLOR PHOTOGRAPHY
Kenneth C. Hudson, Philadelphia, Pa., and Fred E. Shashoua, Cherry Hill, N.J. assignors to The United States of America as represented by the Secretary of the Air Force
Filed Oct. 17, 1968, Ser. No. 768,424
Int. Cl. G03b *33/00*
U.S. Cl. 95—12.20 **2 Claims**

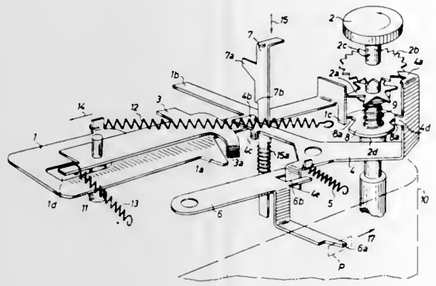


A method and an apparatus for taking color photographs of subjects at very low light levels. A photo-electronic imaging system, including a color encoding filter, an image intensifier tube, and associated optical components is used to form an image of the subjects on black and white film. The film is developed and the resulting transparency then is projected through a decoding filter and associated optical components to form a color image which, if made to impinge upon color film and the film thereafter is developed and printed, results in a color photograph.

3,580,152
PHOTOGRAPHIC APPARATUS
Dieter Engelsmann, Unterhaching; Rolf Schroder, and Erwin Becker, Munchen, Germany, assignors to Agfa-Geuaert Aktiengesellschaft, Leverkusen, Germany
Filed Apr. 11, 1969, Ser. No. 815,358
Claims priority, application Germany, Apr. 19, 1968, A29659
Int. Cl. G03b *1/62, 1/04*
U.S. Cl. 95—31FM **10 Claims**

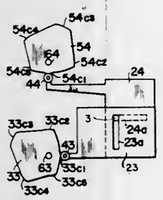
A still camera wherein a pivotable and reciprocable slide permits operation of the shutter release when the film is

transported by the length of a frame and when the tip of a tracking lever extends into one of a row of perforations on the film. The film transporting wheel is arrested by an arresting lever when the latter is free to engage a ratchet wheel connected to the film transporting wheel. A star wheel which is rigid with the other two wheels can move the slide to inoperative position only when a tooth of the slide extends into one of several notches provided in the periphery of a disc



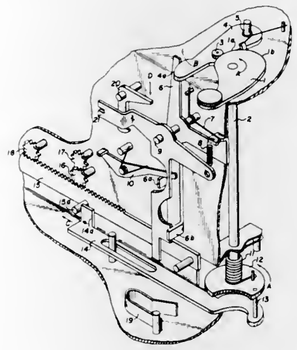
which is connected to the wheels by a friction coupling. The arresting lever is also provided with a tooth which can engage the ratchet wheel only when a lug of the arresting lever extends into another notch of the disc. When the film is removed, the slide is moved to inoperative position and the arresting lever is caused to engage the ratchet wheel when the transporting wheel is rotated through an angle which is smaller than the angle required to advance the film by the length of a frame.

3,580,153
APERTURE POSITION SELECTING SYSTEM FOR USE WITH MULTIPHOTOGRAPHIC DEVICE
Yoshio Fukushima, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Oct. 2, 1968, Ser. No. 764,507
Claims priority, application Japan, Oct. 11, 1967, 42/65278
Int. Cl. G03b *19/02*
U.S. Cl. 95—36 **14 Claims**



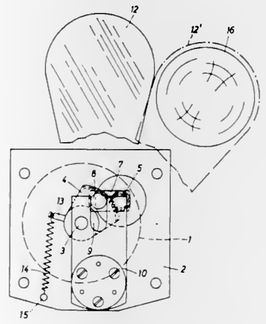
A multiphotographic device has an objective lens positioned to form a real image which serves as an object for a compound second lens. Immediately behind the objective lens are located a pair of superimposed shield plates movable transversely in orthogonal directions. Each plate is provided with a slot extending perpendicular to its direction of movement; the slots defining a rectangular aperture which admits light to the second lens from the first. Motion of the plates is controlled by a pair of cams. Each cam controls the excursion of a shield plate causing the aperture to advance in steps from a starting position to an extreme position while leaving gaps between the steps, and then back to the starting position in steps during a return movement. The aperture, during the return movement, occupies the gaps.

3,580,154
OPERATING MECHANISM FOR MIRROR-REFLEX CAMERA
Helmut Ettischer, Ruit/Krs. Esslingen, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 25, 1968, Ser. No. 770,533
Claims priority, application Germany, Nov. 22, 1967, K-63972
Int. Cl. G03b *19/12*
U.S. Cl. 95—42 **8 Claims**



A mirror reflex camera has a mirror pivoting mechanism that is set in response to film winding and released with the shutter. The mechanism moves the viewing mirror from a viewing position to a picture taking position, and a rapid advance lever is provided for successively displacing the film advancing mechanism by varying amounts, depending on the amount of film on the film winding spool, and for simultaneously imparting substantially constant amounts of energy to the mirror pivoting mechanism with each successive displacement of the film advancing mechanism.

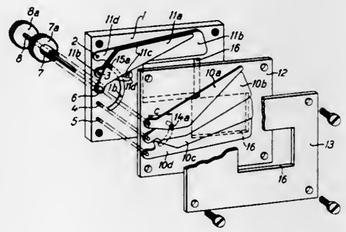
3,580,155
DRIVING ARRANGEMENT FOR SINGLE BLADE SHUTTER FOR PHOTOGRAPHIC APPARATUS
Wolfgang Zahn, Munich; Erlich Nagel, Anzing, and Reinhold Langer, Munich, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Nov. 7, 1968, Ser. No. 773,985
Claims priority, application Germany, Nov. 16, 1967, A28727
Int. Cl. G03b *9/10*
U.S. Cl. 95—53R **9 Claims**



A driving arrangement for filters, shutter blades or analogous light-obstructing elements of photographic cameras or photographic printing apparatus comprises an electromagnet having an armature which is turnable within a

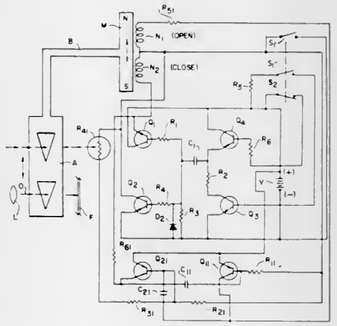
predetermined angle to turn a one-armed lever which is rigid with the light-obstructing element. The motion transmitting connection between the armature and the lever comprises a gear segment on the armature, a gear provided on an intermediate shaft which carries a crank arm, and a pin-and-slot connection between the crank arm and the lever.

3,580,156
SWINGING SECTOR SHUTTER FOR PHOTOGRAPHIC CAMERAS
Peter Loseries, Diez, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany
Filed Dec. 9, 1968, Ser. No. 782,173
Claims priority, application Germany, Dec. 19, 1967, P 15 97 308.7
Int. Cl. G03b *9/26*
U.S. Cl. 95—60 **13 Claims**



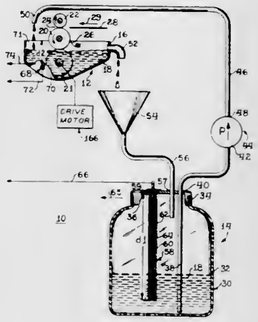
This disclosure pertains to a camera shutter having two swinging sectors. Each sector includes a plurality of separately mounted lamellae actuated by pin and slit connections. The slit-forming edges of each are formed by a single lamella and by a plurality of adjacent lamellae.

3,580,157
AUTOMATIC EXPOSURE CONTROL DEVICE
Oran T. Casebeer, Interlaken, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 7, 1969, Ser. No. 805,174
Int. Cl. G03b *9/04, 19/18;* **G05b** *6/02*
U.S. Cl. 95—64 **13 Claims**



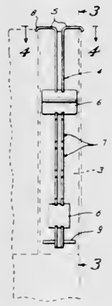
An automatic exposure control device for photographic cameras includes a photocell-controlled multivibrator for varying a diaphragm aperture between minimum light passage and maximum light passage positions. Separate means are provided for automatic positive drive of the diaphragm to its minimum light passage position when the camera is stopped.

3,580,158
LIQUID LEVEL SENSING DEVICE
Peter T. Scholle, Melbourne Beach, Fla., and Samuel L. Webb, Lisle, Ill., assignors to Addressograph-Multigraph Corporation, Mount Prospect, Ill.
Filed Sept. 29, 1969, Ser. No. 861,574
Int. Cl. G03d *3/12, 7/00, 3/06*
U.S. Cl. 95—89G **1 Claim**



Liquid level sensing apparatus is disclosed for use with liquid developing apparatus including a reservoir of conductive developer fluid. A current flow is maintained between the conductive fluid and an electrode included in the sensing apparatus, immersed in the reservoir of fluid. The depletion of developer fluid below a predetermined level causes the cessation of the current flow, which in turn causes the operation of additional circuitry of the sensing apparatus for, indicating the need for replenishment of the fluid, or for preventing the further operation of the developing apparatus.

3,580,159
DENTAL X-RAY FILM HOLDER
Jack B. Buck, 1800 South University Drive, Fort Worth, Tex.
Filed Feb. 20, 1969, Ser. No. 800,976
Int. Cl. G03d *3/00*
U.S. Cl. 95—100 **1 Claim**

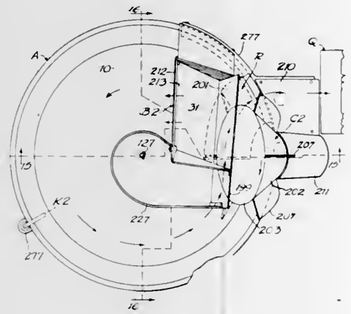


Apparatus for developing individual dental X-ray film consisting of a small processing tank and a holder for a plurality of individual films. The holder includes an elongated member which is H-shaped in transverse section and has a plurality of pairs of inwardly curved indentations formed in marginal portions of two sides thereof. The indentations coincide with the longitudinal edges of the oppositely facing legs of the H. The individual films are arranged transversely of the elongated member and extend laterally beyond the two other sides of the member.

3,580,160
FABRICATED VENTILATOR AND METHOD OF PRODUCING SAME
Francis J. McCabe, P. O. Box 131, Penns Park, Pa.
Filed Apr. 14, 1969, Ser. No. 815,896
Int. Cl. F24f *13/08*
U.S. Cl. 98—121 **12 Claims**

A fixed blade ventilator is fabricated from blades which interlock with side channels to form, without more, a unified structure.

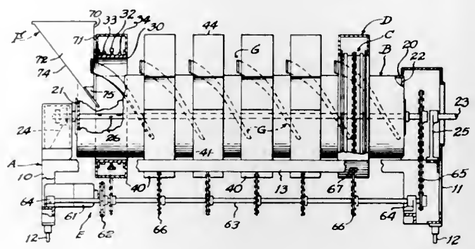
3,580,161
APPARATUS FOR PROCESSING CHEESE CURD INTO HOMOGENOUS CHEESE
Nicholas E. Pontecorvo, Tarzana, Calif. (1548 18th St., Santa Monica, Calif. 90404)
Continuation-in-part of application Ser. No. 712,715, Mar. 13, 1968, now Patent No. 3,476,036. This application Aug. 11, 1969, Ser. No. 849,132
Int. Cl. A23c *19/00*
U.S. Cl. 99—243 **8 Claims**



Cheese processing apparatus comprising a circular tub containing heated water for softening raw cheese curd delivered to it by a fixed hopper, the tub being rotatable to carry the cheese in a circular path of nearly 360° to an elevating conveyor operating adjacent the back side of the hopper to remove the softened curd from the bottom of the tub and elevate it over the tub rim to a kneading unit of the apparatus.

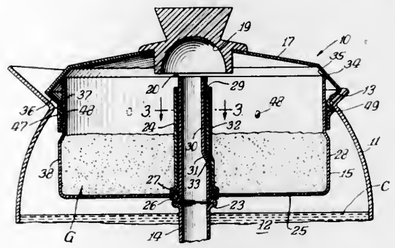
3,580,162
CHEESE KNEADING APPARATUS
Nicholas E. Pontecorvo, Tarzana, Calif. (1548 18th St., Santa Monica, Calif. 90404)
Filed Nov. 3, 1969, Ser. No. 873,265
Int. Cl. A23c *19/12*
U.S. Cl. 99—243 **10 Claims**

Presoftened and moistened cheese curd is kneaded into homogenous consistency such as Mozzarella, by feeding it consecutively into successive annular kneading chambers defined between the cylindrical internal surfaces of a series of axially spaced substantially coaxial rings and the surface of a cylindrical mandrel projecting through the series of rings in eccentric relation thereto, the curd moving circumferentially



through a restricted pass between areas of closest spacing of the opposed cylindrical surfaces into a wider area of a respective chamber, from which it is deflected axially to a succeeding chamber while carried on the surface of the mandrel.

3,580,163
VARIABLE CAPACITY COFFEE PERCOLATOR
Claude S. Farrell, Jr., Northbrook, Ill., assignor to Cory Corporation
Filed Feb. 5, 1969, Ser. No. 796,793
Int. Cl. A47j *31/04*
U.S. Cl. 99—310 **32 Claims**



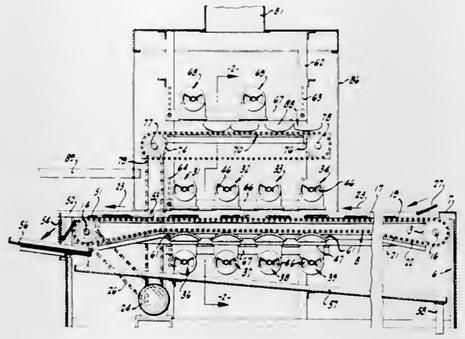
In a percolator having a pump stem for carrying a brewing basket adjacent the upper open end of the receptacle, or pot, cooperating means are provided on the stem and basket for selectively positioning the basket in a normal brewing position within the receptacle and in an extra-capacity position upwardly thereof whereby an additional quantity of beverage such as coffee may be brewed in the receptacle. The percolator includes a cover removably carried on the basket and provided with means for deflecting the hot pumped water downwardly onto the beverage charge in the basket in each of the normal and extra-capacity positions of the basket.

The cooperating support means may comprise shoulder means on the stem and basket. Alternatively, the support means may comprise a spring clip carried by the stem and having portions selectively engageable with the basket. The extra capacity of the percolator may be substantial, such as over 4 cups. The sidewall of the basket may be imperforate to preclude spillage of the hot water such as when the basket is raised to be substantially outward of the open top of the receptacle.

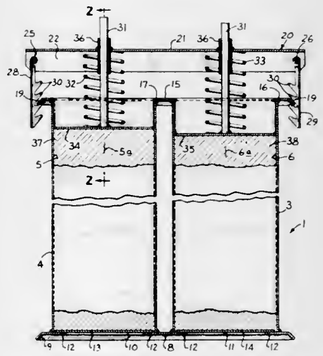
3,580,164
HAMBURGER COOKING MACHINE
Edward D. Baker, Belmont, Calif., assignor to National Industrial Manufacturing
Filed Oct. 9, 1969, Ser. No. 865,102
Int. Cl. A47j *37/00*
U.S. Cl. 99—339 **10 Claims**

A hamburger cooking machine includes a cooking element of the gas-fired, radiant energy, surface combustion type

mounted on a frame in conjunction with an openwork chain patty conveyor arranged with both the upper and lower runs of the conveyor directly exposed to the cooking element. Means on the frame advance the conveyor, and a patty thereon, with respect to the cooking element to grill the patty. A bun conveyor is also mounted on the frame and is similarly moved with respect to a comparable source of heat so that a bun thereon is warmed or toasted. The hamburger patty and the bun are simultaneously conveyed through the machine, and are discharged at about the same time for assembly into a hamburger.

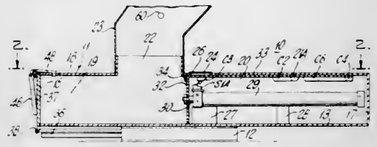


3,580,165
MEAT MOLD
Ralph M. Foldenauer, Chicago, Ill., assignor to Bloomer-Fiske, Inc.
Filed June 6, 1969, Ser. No. 831,039
Int. Cl. A47j *27/20*
U.S. Cl. 99—351 **3 Claims**



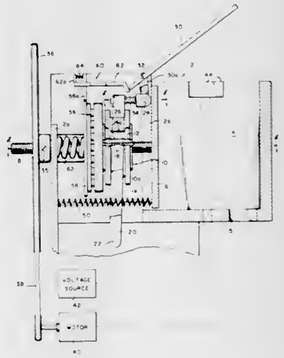
A multiple cavity meat mold, wherein each cavity is open at both ends, has a closure-forming pressure plate for one end of each cavity, each plate being independently biased by a coil spring and provided with a guide pin, coaxial with the coil spring, that fits into a guide sleeve on the spring backing. The plates maintain the ends of the meat in the mold cavities perpendicular to the axis of the associated cavity during the cooking and chilling. The plates are held onto the mold body by a ratchet arrangement. At the bottom of each mold cavity is a removable closure end plate.

3,580,166
COMPACTION APPARATUS
Joseph F. Longo, New Canaan, Conn., assignor to International Dynetics Corporation, Norwalk, Conn.
Filed May 8, 1969, Ser. No. 823,059
Int. Cl. B30b *15/16*
U.S. Cl. 100—49 **22 Claims**



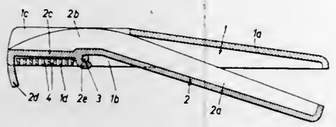
A waste compactor includes a horizontally extending compacting chamber with a cantilevered open-ended front section closed by an openable first gate and a chute communicating with a rear upper feed opening. A ram is hydraulically motivated along the chamber between advanced, retracted and intermediate positions. An electrical network controls the ram when the first gate is closed and material sensed in the chute ro reciprocate the ram between intermediate and retract positions until the hydraulic pressure exceeds an adjustable value at the intermediate position and to reciprocate the ram between the retracted position and a point rearwardly of the intermediate position when hydraulic pressure exceeds a second predetermined value. Upon opening of the first gate the ram can be fully advanced.

3,580,167
CAN CRUSHING APPARATUS
Herbert H. Simshauser, 5532 Beechwood, Ravenna, Ohio
Filed Sept. 19, 1969, Ser. No. 859,411
Int. Cl. B30b *15/18, 15/22*
U.S. Cl. 100—52 **11 Claims**



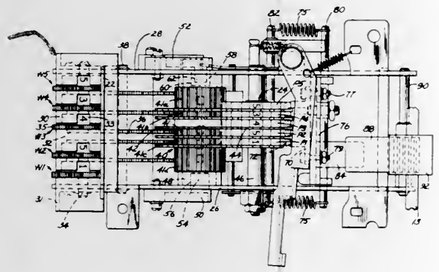
Apparatus for crushing waste objects such as cans, containers, bottles and the like, including motor-driven screw and nut means for displacing a crusher member in a given direction to compress waste objects contained in a crushing chamber. The invention is characterized by the provision of quick-release means for disengaging the nut means from the screw means to permit instantaneous return of the crusher member to its initial retracted position by return spring means. In the preferred embodiment of the invention, the nut means is of the split-nut type including nut sections that are automatically locked into threaded engagement with the screw by an axially shiftable collar upon closure of a cover member upon the crushing chamber. Means responsive to the crushing pressure near the end of the crusher stroke are provided for disengaging the nut sections from the screw means.

3,580,168
HAND SQUEEZER FOR FRUITS AND VEGETABLES
Karl Zysset, Hauptstrasse 31, 3250 Lyss, Switzerland
Filed Aug. 19, 1969, Ser. No. 851,185
Claims priority, application Switzerland, Aug. 28, 1968, 12868/68
Int. Cl. B30b *7/00*
U.S. Cl. 100—234 **5 Claims**



Squeezer has two levers pivotally connected together nearer one end than the other so as to divide the levers into two arms each of unequal length, of which the longer arms constitute the handle and the shorter arms respectively the receptacle for the fruit or vegetable and a plunger, and either the bottom of the receptacle or of the plunger is provided with holes through which the juice escapes.

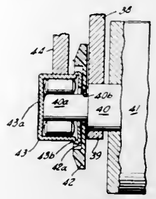
3,580,169
SETTABLE DRUM SERIES PRINTING WHEEL ARRANGEMENT
John A. Maul, Lyndhurst; James T. Zofchak, Mentor, and David D. Anderson, Richmond Hts., Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio
Division of Ser. No. 698,871, Jan. 18, 1968, Pat. No. 3,508,488.
Filed Oct. 8, 1969, Ser. No. 864,643
Int. Cl. B41j *5/02, 1/22*
U.S. Cl. 101—110 **2 Claims**



A data recorder including a plurality of coaxial settable print wheels nested in closely spaced printing relation, and rotary gear trains for positioning the print wheels under control of selectively operable indexing wheels spaced only a short distance from the print wheels. Extension gears are provided for laterally spreading out the rotary gear train from the closely positioned print wheels to the indexing wheels, thereby spreading apart adjacent indexing wheels sufficiently to allow for operator finger contact with the indexing wheels individually to permit independent movement thereof.

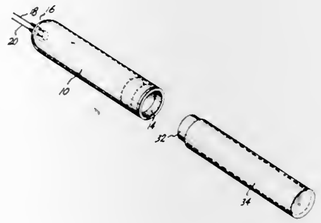
3,580,170
SUPPORT ASSEMBLY FOR A TRAVEL CYLINDER HAVING ROLLING CONTACT WITH THE BED OF A PRINTING MACHINE
George R. Furman, Glenham, N.Y., assignor to Texaco Inc., New York, N.Y.
Filed Aug. 30, 1968, Ser. No. 756,440
Int. Cl. B41f *3/04*
U.S. Cl. 101—269 **6 Claims**

A roller cylinder support assembly consisting of an outboard low friction bearing housing which is nested in an inboard recessed thrust washer and a shaft of appropriate dimensions for supporting the same extending axially through the roller cylinder, the roller cylinder bracket yoke of the ac-



tuating handle contacting the roller cylinder shaft between the roller cylinder and the thrust washer.

3,580,171
FIELD SENSITIZED EXPLOSIVE DEVICES AND SENSITIZING METHOD
Michael E. Maes, Bellevue, Wash., assignor to Explosives Corporation of America, Issaquah, Wash.
Continuation-in-part of application Ser. No. 703,994, Feb. 8, 1968, now abandoned , which is a continuation-in-part of application Ser. No. 631,123, Apr. 17, 1967, now Patent No. 3,419,443, dated Dec. 31, 1968. This application Feb. 25, 1969, Ser. No. 805,987
Int. Cl. F42b *3/10, 3/18*
U.S. Cl. 102—28 **23 Claims**

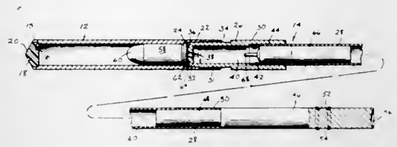


Rigid and flexible container type portable devices incorporating an intrinsically nonexplosive solid constituent of an explosive composition. Sensitizing of the device at the site of use by adding thereto a complementary intrinsically nonexplosive liquid constituent of the explosive composition, for admixing with the solid constituent. Such devices including built-in electrical initiators or fuse wells. Such devices constructed for coupling with a similar container containing the liquid constituent in a frangible capsule, including means for cutting or fracturing the capsule when the containers are moved together, and means for preventing fluid leakage from the assembly or the device. Such two container devices which are joinable in a first prearm, nonmixing position, and are movable into a second mixing position, in which the frangible capsule is fractured.

3,580,172
UNDERWATER PROJECTILE FOR FIRING A CARTRIDGE UPON IMPACT
Grover E. Hendricks, 2241 Lake St., Niles, Mich.
Filed Nov. 27, 1968, Ser. No. 779,371
Int. Cl. F42b *13/54;* **A01k** *81/00*
U.S. Cl. 102—48 **5 Claims**

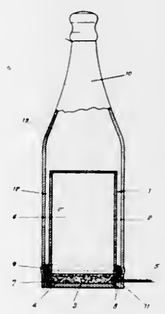
A projectile including an elongated tubular body having an open fore end portion defining a gun bore and an intermediate portion defining a chamber communicating with the gun bore for receiving an ammunition cartridge. A firing pin is slidably disposed within the tubular body rearwardly of the chamber therein and is adapted to be shifted forwardly

within the tubular body to engage the primer of an ammunition cartridge housed within the chamber upon fore end con-



tact of the projectile body with a target to cause detonation of the ammunition cartridge.

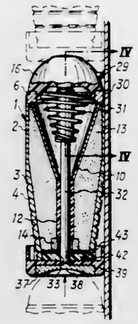
3,580,173
EXPLOSIVE TABLE DECORATION
Adrien Machet, Saint-Denis, France, assignor to Etablissements MACHET, Saint-Denis, France
Filed Mar. 26, 1969, Ser. No. 810,608
Claims priority, application France, Apr. 4, 1968, 146984
Int. Cl. C06d *1/00*
U.S. Cl. 102—37.2 **2 Claims**



In an explosive table decoration covered with decorative cover which does not enable it to be seen at first glance what it actually is, and containing objects to be distributed and an explosive charge to blow out the decorative cover and the objects in question, a particular method of connection of the actual explosive device and the aforesaid decorative cover.

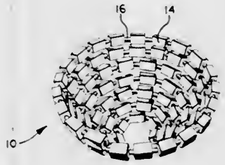
3,580,174
PROJECTILE WITH HOLLOW EXPLOSIVE CHARGE
Robert Apotheloz, Wallisellen; Hans-Ulrich Bigler, Opfikon, and Rene Kessler, Zurich, Switzerland, assignors to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland
Filed Feb. 18, 1969, Ser. No. 800,161
Claims priority, application Switzerland, Mar. 7, 1968, 3494
Int. Cl. F42b *25/20, 25/16*
U.S. Cl. 102—56 **4 Claims**

A projectile having a body with an explosive charge having a cavity. A lagging is located in the cavity and a passage in the charge extends centrally rearwardly from the cavity. A primary detonator for the charge is before firing located in a position of rest and after firing is located in an ignition position at the front end of the passage. A secondary detonator is situated in its position of rest in the cavity and a rod extends through the passage having the secondary detonator fastened



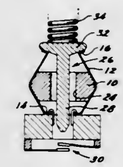
to the forward end thereof and which on firing is adapted to slide to the rear in the passage.

3,580,175
FRAGMENTATION EXPLOSIVE DEVICE
James E. Kenney, and Richard J. Ashenfelter, both of Toledo, Ohio, assignors to Gerity-Schultz Corporation, Toledo, Ohio
Filed Sept. 19, 1968, Ser. No. 760,761
Int. Cl. F42b *13/48*
U.S. Cl. 102—67 **4 Claims**



A fragmentation explosive device consisting of a plurality of projectiles cast within matrix material which vaporizes at the explosion temperature, wherein the projectiles are formed of a length of strip material having frangible zones at spaced intervals along the length thereof.

3,580,176
FUZE WITH IMPACT SWITCH
George T. Boswell, Springfield, Va., assignor to The Susquehanna Corporation
Division of Ser. No. 647,355, June 20, 1967, Pat. No. 3,457,382.
Filed Feb. 28, 1968, Ser. No. 823,223
Int. Cl. F42c *1/08, 9/10*
U.S. Cl. 102—75 **17 Claims**

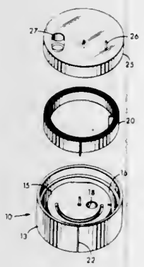


An impact weight is releasably engaged, supported, and caged by a plurality of springlike supports which also releasably engage a spring-loaded operator and hold it in the cocked position. The weight moves in response to impact or

a predetermined level of vibration to dislodge the supports and allow the operator to be driven home by the spring.

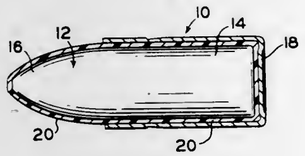
In the fuze, a safety slide locks the supports until removed by the action of an explosive or mechanical delay mechanism. Once the supports are unlocked the weight is free to move upon impact, then dislodging the supports and allowing the operator to strike a detonator to fire the weapon. Should there be little or no impact, the delay train causes the operator to be released after a predetermined interval notwithstanding the position of the supports.

3,580,177
ROTATIONALLY RESPONSIVE DEVICE
Fred Krahulec, Phoenix, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Oct. 2, 1968, Ser. No. 764,391
Int. Cl. F42c *15/26*
U.S. Cl. 102—79 **6 Claims**



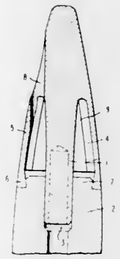
A rotor is rotationally supported on a housing and spring urged in a first rotational sense. The spring is a multiconvolution resilient steel tape wound on the rotor and disposed between the rotor and the housing in a narrow annular space. Rotation of the housing in a second rotational sense urges the rotor to unwind the spring tape and thereby rotate a predetermined distance. A configuration for a safe and arm mechanism is disclosed.

3,580,178
EXTERNALLY LUBRICATED PROJECTILE AND METHOD OF MAKING SAME
Paul J. Kopsch, 710 Faster Park Road West; Daniel Turcus, Jr., 1019 W. 38th St., Lorain, and Donald F. Ward, Telegraph Road, South Amherst, Ohio
Filed Oct. 31, 1967, Ser. No. 679,391
Int. Cl. F42b *11/14*
U.S. Cl. 102—92.2 **3 Claims**



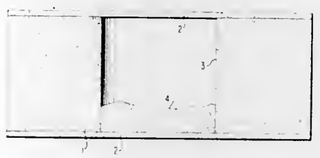
A bullet having a core which is secured to a jacket. At least the piercing end or extremity of the core is coated with a low-friction fluorocarbon resin, such as polytetrafluoroethylene. The resin may also be used to secure the jacket to the core.

3,580,179
AMMUNITION FOR TARGET PRACTICE OR OTHER SHORT-RANGE PURPOSES
Heinz Gawlick; Rudolf Stahlmann, Furth, and Hans Umback, Stadeln, Kronacher, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany
Filed Sept. 6, 1968, Ser. No. 757,898
Claims priority, application Germany, Sept. 6, 1967, P 15 78 123.4
Int. Cl. F42b *11/18*
U.S. Cl. 102—92.7 **13 Claims**



Projectiles designed for practice or other limited-range purposes, including a tip which will disintegrate and/or be jettisoned from the body of the projectile and laterally deflected from the path thereof shortly after exit from the barrel of the firearm, which tip is constructed with a longitudinal cross section deviating from rotational symmetry and/or an annular hollow space surrounding the central core thereof and extending rearward, which hollow space is defined by the outer shell of the tip, having a thickness such that it may be ruptured by the pressure of the propellant gases.

3,580,180
CONSUMABLE INDUSTRIAL PROPELLANT CARTRIDGE
Heinz Gawlick, Furth, and Gunther Marondel, Erlangen, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany
Filed Sept. 19, 1967, Ser. No. 668,797
Int. Cl. F42b *1/02*
U.S. Cl. 102—101 **7 Claims**

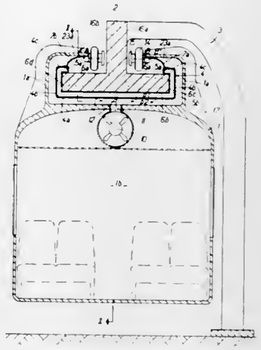


A consumable industrial propellant cartridge having a form-stabilized annular propellant charge body filled with loose ignitor composition and closed at both ends with a relatively thin powder foil coated on its inside surface with a percussion-sensitive material, for example, tetrazene or tetrazene-trizinate.

3,580,181
SURFACE-EFFECT TRANSPORT SUPPORT SYSTEMS
Jean Henri Bertin, Neuilly-sur-Seine, and Francis Marie Jean Croix-Marie, Viry-Chatillon, France, assignors to Bertin & Cie, Plaisir, France
Filed Dec. 29, 1969, Ser. No. 888,316
Claims priority, application France, Dec. 27, 1968, 181,381
Int. Cl. B60v *3/04, 1/06*
U.S. Cl. 104—23FS **28 Claims**

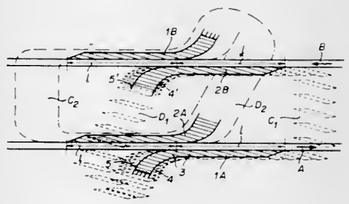
A transport system comprising a surface-effect vehicle movable along a prepared track, the vehicle having means

for defining a first fluid cushion of predetermined pressure below ambient pressure and cooperating with the track, and second means combining with the first means to define a



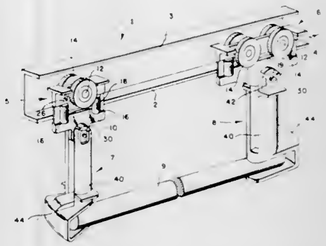
second fluid cushion of a pressure lower than said predetermined pressure, so that the vehicle cooperates with track through superimposed fluid cushions.

3,580,182
VARIABLE-SPEED TRANSPORT APPARATUS
Gabriel Bouladon, St.-Loup/Bersoix, and Paul Zuppiger, Athenaz/Geneva, Switzerland, assignors to Battelle Memorial Institute, Carouge/Geneva, Switzerland
Filed Apr. 22, 1969, Ser. No. 818,241
Claims priority, application Switzerland, Apr. 26, 1968, 6280/68
Int. Cl. B65g *17/06*
U.S. Cl. 104—25 **11 Claims**



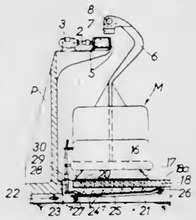
A variable-speed passenger transporter for conveying passengers from a stationary surface to a belt moving at constant speed, which includes a plurality of rhomboid platforms driven along guide means in a closed circuit along a section of which the platforms are in contacting relationship to form a moving floor. Along the initial portion of this section the platforms travel at low speed and at right angles to their center lines towards the belt but at an angle thereto. Along the following portion they are shifted along one another without changing their orientation to increase their speed until they come alongside the belt. The platforms then move with the belt at more or less the same speed as the latter and at an angle thereto, the oblique ends of the rhomboid platforms providing the moving floor with a substantially straight edge at least alongside the belt. A reverse, decelerating, arrangement and various modified constructional forms are also provided.

3,580,183
TROLLEY AND HANGER APPARATUS
Richard E. Nearman, Mount Airy, Md., assignor to Automated Handling Systems, Inc., Washington, D.C.
Filed May 13, 1968, Ser. No. 728,513
Int. Cl. B61b *3/00*
U.S. Cl. 104—111 **13 Claims**



Flat trolley bodies having perpendicular tabs along upper edges thereof for mounting axles and guide rollers to prevent the trolley bodies from scraping along tracks, hangers having integrally formed arcuate bumpers, and combinations of trolleys and hangers having motion-limiting stops near hinged interconnections are described herein.

3,580,184
TRANSPORTATION SYSTEMS
Francois Louis Giraud, Plaisir, France, assignor to Societe De L—Aerotrains, Paris, France
Filed May 4, 1969, Ser. No. 813,597
Claims priority, application France, Apr. 5, 1968, 147,270
Int. Cl. B61b *13/08*
U.S. Cl. 104—165 **17 Claims**



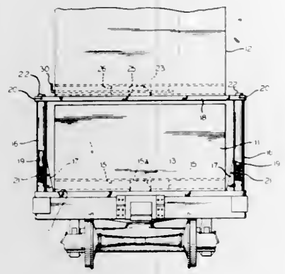
The present invention relates to improvements in transportation systems and in particular passenger transportation systems of the kind in which the payload carrier is borne by a conveyor arrangement, the improvements comprising means for automatically or manually engaging said payload carriers with, and disengaging them from, the conveyor means by the use of ground-effect arrangements in association with special track formations.

3,580,185
SYSTEM AND APPARATUS FOR HOLDING FREIGHT CONTAINERS TO VEHICLES AND THE LIKE
John Bridge, 407 S. Dearborn St., Chicago, Ill.
Filed Aug. 27, 1968, Ser. No. 755,677
Int. Cl. B65j *1/22*
U.S. Cl. 105—366 **8 Claims**

System for locating and locking freight containers on vehicles such as freight cars, trailers, trucks, ships decks and the like. A series of loaded containers may be mounted on the vehicle deck, either in alignment with each other or one above the other. The loaded containers are located and retained to the deck by a dome lock accommodating limited vertical movement of the container but relieving the container from shocks and twisting forces of the vehicle deck.

Low-height containers are mounted directly on the deck

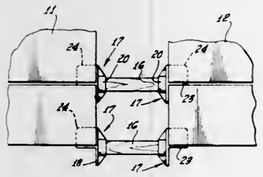
and retained to the deck by dome-centering devices extending upwardly of the deck. Crossbeams extend over the low-height containers and form supports for upper containers. These beams have centering domes thereon mounted at their ends for controlled vertical movement with respect to the deck.



In another form of the invention the domes are at opposite sides of the deck and are placed along the deck to take care of containers of various lengths and are mounted on the deck for vertical shifting movement in controlled paths.

In still another form the domes are mounted on the lower container, and a second container is supported directly on the lower container.

3,580,186
CARLOADING BOX SPACERS
Harold C. Pierce, 1527 Ganesha Place, Pomona, Calif.
Filed Apr. 15, 1968, Ser. No. 721,257
Int. Cl. B61d *45/00*
U.S. Cl. 105—369 **10 Claims**

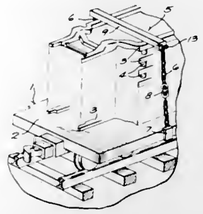


The invention provides a new spacer component and spacer assembly for use in the stabilization of carload boxes during transit, the assembly comprising an elongated spacer member carrying at one or each of its ends a molded plastic attachment having a body portion extending normal to the spacer and held thereto at one side, and having web means projecting from the opposite side of the body for reception between loaded boxes.

3,580,187
LOAD TIEDOWN TENSIONER
Lawrence P. Marks, Brown Deer, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.
Filed July 2, 1968, Ser. No. 742,045
Int. Cl. B61d *45/00;* **B60p** *7/08*
U.S. Cl. 105—369 **8 Claims**

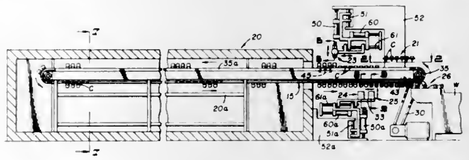
The present disclosure relates to tiedown means. A stack of vehicle frames are mounted on a bed. A box beam is disposed over the frames or integrated into the bed. A pair of parallel torsion shafts having a high spring rate are mounted in the box beam. The first shaft is fixed at one end to the beam end wall and protrudes from the opposite wall. A crank is secured to the free end of the first bar and disposed between a pair of stop elements on the end wall. The shaft is prestressed to engage the one stop with a selected stored energy with the holding rotation of the arm increasing the stress. The second shaft is similarly constructed, but oppositely disposed to dispose the crank to the opposite end of the assembly.

Suitable straps or chains are interconnected to the cranks to clamp the load to the bed. A one-way locking means selec-



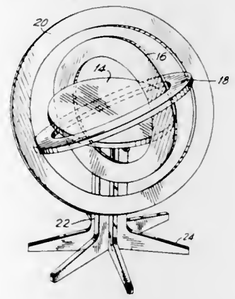
tively limits the movement of the crank to prevent pivoting and increasing the shaft stress after the initial setting.

3,580,188
APPARATUS FOR PRODUCING FROZEN COATED ICE-CREAM CONES
Thomas H. Lutsey, Green Bay, Wis., assignor to Big Drum, Inc., Columbus, Ohio
Filed Sept. 23, 1969, Ser. No. 860,377
Int. Cl. A23g *3/24;* **F25c** *7/04*
U.S. Cl. 107—1A **8 Claims**



Apparatus for making frozen edible articles, such as frozen ice cream cones of the type comprising a pastry container or cone having frozen ice cream filling and extending from the mouth end thereof, with a coating of chocolate and nuts on the protruding ice cream. The apparatus includes an endless conveyor which receives the upright cones to be filled with ice cream, and progressively moves the upright cones to a filling station where they are filled with ice cream that extends from the upper mouth end thereof; moves the filled cones through an elongated freezing chamber from which they emerge in inverted position on the conveyor fully frozen; moves the filled cones while inverted to successive stations where they are coated with syrup and edible particles, such as chocolate and nuts or the like; and finally discharges the frozen inverted coated cones at a wrapping station.

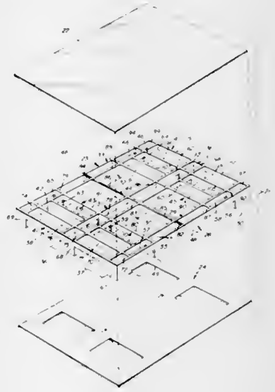
3,580,189
TABLES HAVING POSITIONS OF USE AND NONUSE
Edith Brown Eisenberg, 48 Brower Ave., Woodmere, N.Y.
Filed Sept. 18, 1969, Ser. No. 859,038
Int. Cl. A47f *5/12;* **A47b** *3/00*
U.S. Cl. 108—3 **9 Claims**



A table which has movable and stationary components coacting to provide for the table a position of use and a posi-

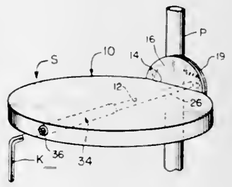
tion of nonuse. The table includes a tabletop made up of a plurality of these components which closely surround each other and are located in a common plane when in the position of use. These components include an inner stationary section of the tabletop and a plurality of endless components one surrounding the other and including an inner endless component which directly surrounds the stationary inner section. A plurality of pivots interconnect the several components one with the next for swinging movement with respect to each other about predetermined axes for situating the several components in different planes, respectively, when the tabletop has a position of nonuse.

3,580,190
PALLET CONSTRUCTION
Timothy J. Fowler, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Jan. 7, 1970, Ser. No. 1,269
Int. Cl. B65d *19/18*
U.S. Cl. 108—58 **10 Claims**



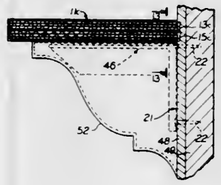
A substantially rectangular pallet which can be raised and transported by forklift truck arms inserted through any one of the four side edges thereof and which can span across its narrow width. The pallet has a top deck, a bottom deck, and a structural network mediate therebetween which all coact together. The structural network has longitudinally extending and transversely extending stringer members interconnecting with one another. The pallet construction is well suited for formation from two, or three preformed pieces of plastic material and is especially adapted for use by the food industry in shipping and warehousing foodstuffs.

3,580,191
REMOVABLE SHELF
Thomas M. McDonnell, 11 N. 4th Ave., Maywood, Ill.
Filed Mar. 2, 1970, Ser. No. 15,350
Int. Cl. A47b *5/00*
U.S. Cl. 108—152 **10 Claims**



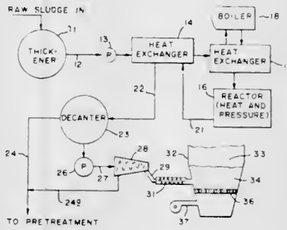
A shelf device adapted to be removably attached to a support extending at any angle in a vertical plane, comprising: a table, a retaining plate secured to one side of the table, a clamp carried by the table, and means carried by the table for moving the clamp toward and away from the retaining plate for clamping the support therebetween.

3,580,192
COMPOSITE MANTLE SYSTEM
Louis Davidson, 24 Waterview Road, Oceanside, Long Island, N.Y.
Filed Dec. 11, 1969, Ser. No. 884,268
Int. Cl. A47g *29/02;* **E04f** *19/08*
U.S. Cl. 108—152 **8 Claims**



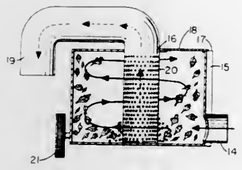
This invention is a composite mantle system for providing a room with a simple shelf mantle which can be added to from time to time to make a more elaborate mantle system and with provision for including a simulated fireplace under the mantle as part of the mantle system. Most parts are compatible with one another and constructed so that installations and additions can be made on a modular "do-it-yorself" basis, and most of the parts are designed for construction from heavy kraft paper or corrugated paperboard, or plastic materials, or a combination of them, to provide an inexpensive form of the invention. Combinations of parts and connecting brackets provide for additions without having to tear out previous constructions to permit the additions to the system.

3,580,193
HEAT TREATED WASTE SLUDGE DISPOSAL
Robert P. Logan, West Redding, and Orris E. Albertson, Norwalk, Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.
Filed Sept. 5, 1969, Ser. No. 855,633
Int. Cl. F23g *7/00*
U.S. Cl. 110—8 **20 Claims**



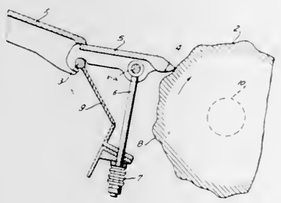
Sewage sludge is pressure cooked by heat exchange to 350—400° F. at a pressure sufficient to prevent evaporation for approximately 30 minutes to free bound cell water. The freed water is decanted and the remaining sludge is dewatered by centrifuge or filter to a very dry cake having a solids content of 35 to 75 percent. The cake is continuously fed to a fluidized bed combustion chamber for autogenous combustion wherein the sludge is reduced to inert burned exhaust gases and finely divided ash entrained with the gases. The dry cake readily crumbles into small pieces and may be screw fed or milled and blown into the combustion chamber. The high solids content, crumbly nature and nonordorous character of the cake simplifies feeding requires no auxiliary fuel after start up, or preheating of combustion air and decreases the size and capital cost of the combustion reactor.

3,580,194
LEAF BURNER ATTACHMENT FOR LAWN MOWERS
Harold Withers, 35 Ohio Ave., Poland, Ohio
Filed Nov. 13, 1969, Ser. No. 876,355
Int. Cl. F23g *9/00*
U.S. Cl. 110—18 **4 Claims**



A leaf burner attachment for lawn mowers includes a cylindrical combustion chamber with a centrally disposed vertically standing perforated vent stack which extends from a bottom portion of the cylindrical combustion chamber and through a top portion thereof, leaves and air are introduced at one side of the cylindrical combustion chamber near the bottom thereof through an opening which communicates with a duct positioned on a tangent with respect to the wall of the cylindrical combustion chamber so that air and leaves introduced into the cylindrical combustion chamber will spin centrifugally therein and around the centrally disposed perforated vent stack.

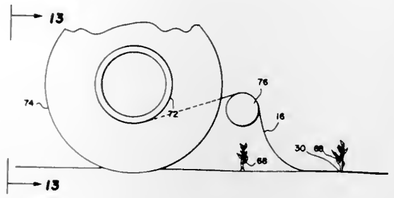
3,580,195
GRATE FOR INDUSTRIAL FURNACES
Johannes Josef Martin, Leopoldstrasse 248, Munich 23, Germany
Filed Apr. 1, 1969, Ser. No. 811,765
Claims priority, application Germany, Apr. 6, 1968, P-P 17 51 126.1
Int. Cl. F23b *1/24*
U.S. Cl. 110—35 **11 Claims**



A grate, particularly of the type used for removing waste material from large industrial furnaces, which comprises a movable, biased transfer grate element between a fixed grate element and a rotary grate element. The transfer element is in sliding contact with the rotary grate element.

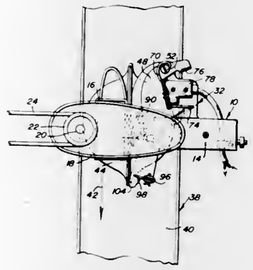
3,580,196
PLASTIC MULCH
Earston Arthur Lofgreen, Coolidge, Ariz., assignor to Occidental Petroleum Corporation
Filed May 27, 1968, Ser. No. 732,226
Int. Cl. A01g *1/00*
U.S. Cl. 111—1 **2 Claims**

An agronomic mulch sheet and method comprising a flexible mulch sheet having first openings spaced a distance equaling the desired spacing of plants and release portions in said sheet whereby the first openings may be enlarged when they are pulled upwardly over partially grown plants in order to remove the sheet from a plant row; the method comprising preliminary planting of seeds in closely spaced relation, and



the growth of plants through areas only covered by said openings in said sheet.

3,580,197
SWITCH FOR SEWING MACHINE CONTROL AND THREAD CUTOFF
Angelo Mascaro, 808 S. E. Granger, Des Moines, Iowa
Filed Nov. 18, 1969, Ser. No. 877,659
Int. Cl. D05b *13/02*
U.S. Cl. 112—11 **9 Claims**

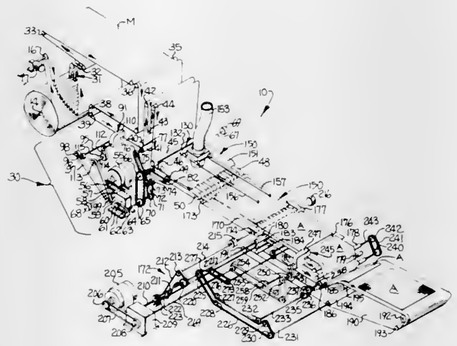


A spring-urged lever oscillatably supported from a bag closing sewing machine head and including a free end swingable between first retracted and second extended positions on opposite sides of a feed path along which bags are fed into and discharged from the sewing machine. The lever is spring-biased toward the extended position thereof and its free end includes knife structure for cutting the thread chain extending rearwardly from a bag discharged from the sewing machine as the free end of the lever swings across the feed path of the machine. The base end of the lever has a switch operatively associated therewith for opening the electrical circuit to the electric motor of the sewing machine whenever a bag to be sewn by the machine is not disposed within a predetermined zone extending along the feed path on both sides of the sewing machine head.

3,580,198
APPARATUS FOR AUTOMATICALLY FABRICATING INDIVIDUAL ARTICLES
Richard K. Teed, Greenwood, S.C., and Karl W. Klose, Findlay, Ohio, assignors to Riegel Textile Corporation, Ware Shoals, S.C.
Filed Aug. 26, 1969, Ser. No. 853,225
Int. Cl. D05b *19/00*
U.S. Cl. 112—121.11 **14 Claims**

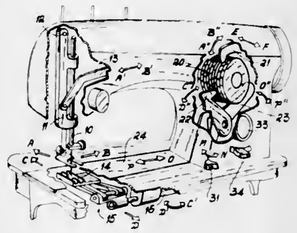
Apparatus for automatically fabricating individual articles, such as blankets and the like, from a continuous length of textile material comprising the following component parts. Supply means supplying a continuous length of textile material. First interrelated, intertimed feeding means feeding the continuous length of material from the supply means in an elongate path of travel along a longitudinally extending axis

through the apparatus. First and second driven stitching means applying lines of stitching along the longitudinal edges of the continuous length of material into a plurality of successive individual articles of a predetermined length. Turning means successively turning each individually cut article 90° for continued travel through the apparatus. Second interrelated, intertimed feeding means receiving the individually cut



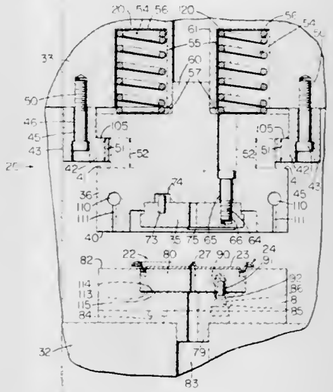
articles from the turning means and feeding them in a continued elongate path of travel along the aforesaid longitudinally extending axis through the apparatus. Third and fourth driven stitching means applying lines of stitching along the cut edges of each of the individually cut turned articles so that each of the articles will be stitched along all four of its edges.

3,580,199
EMBROIDERY STITCHING SEWING MACHINE
Luigi Vigorelli, 80, Viale Partigiani, 27100 Pavia, Italy
Filed May 5, 1969, Ser. No. 822,862
Claims priority, application Italy, May 8, 1968, 16231A/68
Int. Cl. D05b *3/02*
U.S. Cl. 112—158 **8 Claims**



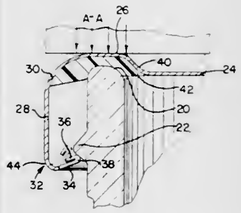
The disclosure relates to an embroidery stitching sewing machine in which a laterally oscillatable needle-bar can be selectively connected to any cam of a plurality of cams for providing zigzag and ornamental stitching, and in which a work fabric feeding device can be automatically controlled by cam means for providing a feeding sequence including forward and rearward steps. Said cam means comprise one cam of such cam track profile to provide a sequence comprising two steps forward and one step backward to produce a stitching wherein in any stitch pitch three sewing stitches are present, the cams of said plurality providing ornamental and utility embroidery and zigzag patterns compatible with said sequence.

3,580,200
APPARATUS FOR AND METHOD OF FORMING A SHEETLIKE WORKPIECE
Daniel S. Cvacho, and Edward H. Fritchey, Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.
Filed July 17, 1968, Ser. No. 745,593
Int. Cl. B21d *51/26*
U.S. Cl. 113—1 **23 Claims**



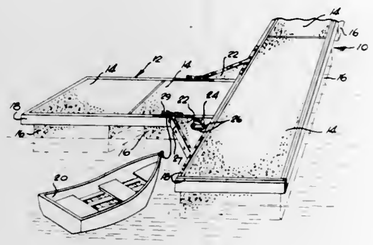
An apparatus for and method of forming a sheetlike workpiece wherein the workpiece is formed utilizing forming dies which have control surfaces which do not engage the workpiece and such control surfaces control the action of the forming dies to assure that a known substantially exact amount of working material remains after forming such workpiece.

3,580,201
CLOSURE
Peter A. Vercillo, Chicago, Ill., assignor to Continental Can Company, New York, N.Y.
Division of Ser. No. 786,219, Dec. 23, 1968, Pat. No. 3,494,497
Filed Aug. 28, 1969, Ser. No. 872,794
Int. Cl. B21d *51/00*
U.S. Cl. 113—121 **3 Claims**



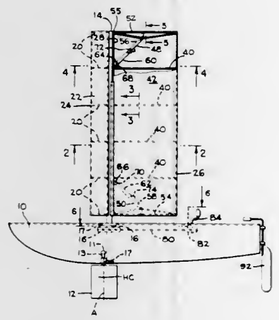
A closure for a container having a top seal finish and a side finish having thread means or closure locking means thereon in which the closure includes an outer shell having a top panel portion, an outer margin portion, a gasket disposed at least partially within said margin portion on an interior surface thereof, and a skirt depending from said outer margin, and including a plurality of fastening elements disposed about the bottom thereof. The fasteners include inwardly extending fingers, spring biased inwardly but resiliently movable outwardly. The resulting closure may be pressed, without intentional rotation, over the finish portion of a container, and will lock in place thereover as the fastening elements deflect outwardly when passing over the threads and thereafter engage the threads to hold the closure in position, while the gasket portion engages at least the top finish of the container in a sealing relation. Subsequent rotation will then unscrew the cap in a conventional manner.

3,580,202
FLOATING WHARF STRUCTURE
Kenneth L. Thompson, Huntington Beach, Calif., assignor to Ye Dock Master, Inc.
Filed Mar. 11, 1969, Ser. No. 806,249
Int. Cl. B63b *35/00*
U.S. Cl. 114—0.5 **9 Claims**



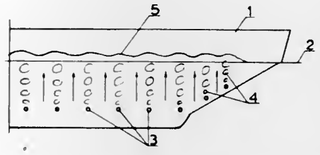
A floating wharf structure wherein interconnected walkways are provided spaced from the top surfaces of supporting pontoons. Each of the walkways comprises a flat sheet of wire mesh screen and spacing means are defined by reinforcing bars disposed downwardly from the sheet. The screen and bars are encased in concrete shaped to define the walkway and integral spacing means. The walkways are interconnected by flanges extending downwardly from the walkways to contralaterally flank underlying pontoons. Each pontoon comprises walls of concrete defining a chamber and polymer foam filling the chamber.

3,580,203
SAILBOAT
Benjamin P. Martin, 1249 Lime Drive, Sunnyvale, Calif.
Filed Nov. 5, 1968, Ser. No. 773,413
Int. Cl. B63b *35/00*; **B63h** *9/06*
U.S. Cl. 114—39 **15 Claims**



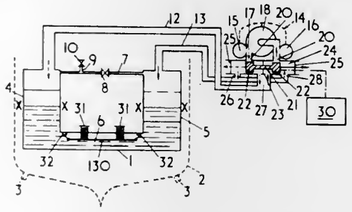
A sailboat including hull having a mast mounted for full 360° rotation thereon and forming the central portion of a sail having the configuration of an air foil and arranged to collapse together with means for adjusting the sail position, the sail being supported so that its aerodynamic center is closely adjacent its axis of rotation and cooperatively arranged with a rotatable centerboard to achieve optimum utilization of the propulsive forces of a wind.

3,580,204
ARRANGEMENT IN SHIPS
Fred Burmeister, Parksvangen; Ernst Enkvist, Grondal; Bengt Johansson, Kadettvagen, and Valter Kostilainen, Niittykumpu, Finland, assignors to Oy Wartsila Ab, Helsinki, Finland
Filed Nov. 12, 1968, Ser. No. 774,654
Claims priority, application Finland, Nov. 11, 1967, 3044/67
Int. Cl. B63b *1/38*
U.S. Cl. 114—67 **6 Claims**



An arrangement in ships, especially in ships moving in ice filled waters, the arrangement comprising underwater/air blowing openings at the side of the ship, preferably in the bow area of the ship. By blowing air through the openings a strong upwards directed water flow is produced which at the water surface bows sidewards. This water flow can be used to facilitate the moving of the ship in ice filled waters and as an auxiliary steering means.

3,580,205
SHIP STABILIZERS
John Bell, deceased, late of Beckenham, Kent, England, Barclays Bank Limited and Bella Bell Executors, Beckenham, Kent, England, assignors to Muirhead Limited, Kent, England
Filed Jan. 31, 1969, Ser. No. 796,649
Claims priority, application Great Britain, Feb. 2, 1968, 5374/68
Int. Cl. B63b *43/06*
U.S. Cl. 114—125 **6 Claims**

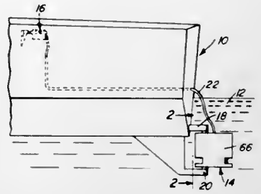


A tank stabilizer for marine use has a high-Q tuned U-tank system in which the water levels in the two side tanks are boosted, when the system is operating at resonance, by a booster arrangement. The booster arrangement is insufficiently powerful to operate the stabilizer as an active stabilizer but improves the Q factor of the tank system to enhance its stabilizing power. The booster arrangement is controlled by roll-sensing means.

3,580,206
AUTOMATIC PILOT
William R. Duncan, Rte 3, Box 249, Sequim, Wash.
Filed Mar. 11, 1969, Ser. No. 806,105
Int. Cl. B63h *25/00*
U.S. Cl. 114—144 **8 Claims**

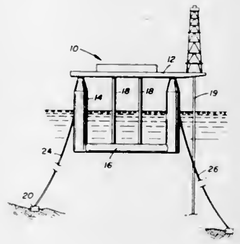
A compass-controlled valve continuously regulates differential, atmospheric venting of opposite lateral sides of a venturi throat in a flow passage extending through a rudder which directionally controls movement of a craft. The dynamic pressure of a flow stream through the rudder passage is thereby controlled to directionally drive a turbine

wheel geared to the pivot shaft of the rudder for corrective angular movement of the rudder, reestablishing the craft



heading corresponding to the adjustable setting of the compass-controlled valve.

3,580,207
METHOD AND MEANS FOR MOORING
Frans V. A. Pangalila, Matawan Township, assignor to John J. McMullen Associates, Inc., New York, N.Y.
Filed Apr. 4, 1969, Ser. No. 813,598
Int. Cl. B63h *25/00*; **B63b** *35/44*
U.S. Cl. 114—144 **9 Claims**



A method and means for mooring and particularly adapted for mooring semisubmersible platforms, such as drilling platforms used in the offshore drilling of oil wells. The invention contemplates providing the platform with a series of tensioned mooring lines, sensing means for sensing tension in the various mooring lines, and means for relieving the tensions on selected mooring lines responsive to the tension on a mooring line rising above its initially tensioned condition due to surge motions of the platform resulting from wind and waves

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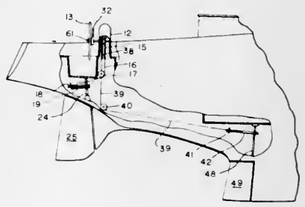
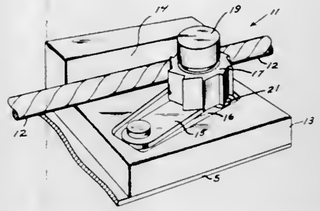
3,580,208
RUDDER CONTROL FOR A SAIL BOAT
Henry R. Hinckley, Southwest Harbor, Maine, assignor to Henry R. Hinckley & Company, Southwest Harbor, Maine
Filed June 26, 1969, Ser. No. 836,808
Int. Cl. B63h *25/06*
U.S. Cl. 114—163 **10 Claims**



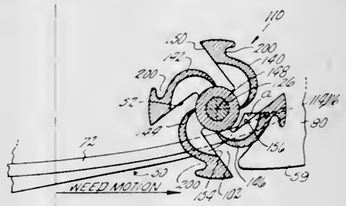
A rudder control for a sail boat which has a main rudder and an auxiliary rudder with means to selectively operate the rudders separately or in unison which includes the use of a locking member.

3,580,209
CONTROLLED RELEASE SAFETY CLEAT
Birger H. Olson, Lansing, Mich.
Filed Sept. 10, 1968, Ser. No. 856,657
Int. Cl. B63b *21/08*
U.S. Cl. 114—218 **7 Claims**



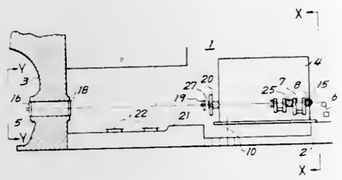
A friction-controlled release safety cleat apparatus for automatically and controllably permitting movement of a sheet therethrough in response to an excess force acting on the sheet. The cleat apparatus consists of a base member having a raised sheet guide wall along one side thereof. A spring biased cam arm is pivotally mounted on the base member and is provided with a freely rotatable ratchet wheel thereon. The ratchet surface of the ratchet wheel is adapted to press against a sheet positioned against the guide wall. A tightening means is provided on the cam arm in association with the ratchet wheel so as to selectively restrict the ratchet wheel against rotation below a predetermined force level. The ratchet wheel and sheet guide wall are adapted to retainably hold a sheet therebetween against movement and to permit a controlled playing out of the sheet only while a predetermined force upon the sheet is being exceeded.

3,580,210
NONCLOGGING MARINE GRILLE WITH UNPOWERED WEED-CUTTING PROVISIONS
Niels Alf Svensen, Avon, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed July 3, 1969, Ser. No. 838,820
Int. Cl. B63h *5/16*
U.S. Cl. 115—0.5 **26 Claims**



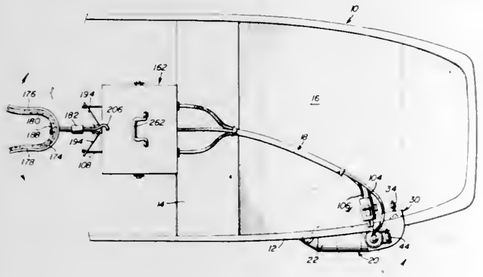
A nonclogging marine grille which includes a plurality of rod members extending rearwards from the forward end in cantilevered fashion substantially the full distance across the water inlet opening in the direction of vessel travel and spaced to prevent the passage therebetween of harmful debris and shaped to cause debris to move therealong due to hydrodynamic forces acting thereagainst due to vessel motion. The rod members terminate short of the after end of the inlet and at a selected distance therefrom so that objectionable debris cannot pass through the gap between the rod member ends and the inlet surface but so that weeds which have draped across the rod members and passed aft free of the rod members may be ingested into the inlet or passed free thereof. The grille also includes a central stiffener member similarly shaped but extending across the full inlet opening length and projecting from the hull and outwardly of said rod members to prevent damage to the inlet grille during beaching and shallow water operations, and including weed cutters propelled by weed movement and hydrodynamic forces coacting therewith to cut any weeds which drape therearound and are passed to the after end thereof and which would otherwise clog the inlet.

3,580,211
METHOD OF SHAFT ALIGNMENT OF A MAIN ENGINE SHAFT IN SHIPBUILDING
Hajime Kurashiki, Tokyo, and Yoshiharu Ikuta, Ichihara, Chiba, Japan, assignors to Mitsui Shipbuilding and Engineering Co. Ltd., Tokyo, Japan
Filed July 16, 1969, Ser. No. 842,250
Claims priority, application Japan, July 18, 1968, 43/50996
Int. Cl. B63b *11/06*
U.S. Cl. 115—0.5 **1 Claim**



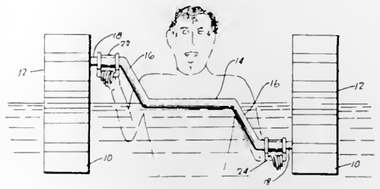
A method of aligning the shaft of a main engine with the centerline of the propeller shaft in which the main bearing pins of the crankshaft are made hollow to permit sighting through the crankshaft and the bearings for alignment of all of the elements. The elements are aligned approximately by threading a piano wire through the elements and are more precisely adjusted by visual alignment after removal of the wire.

3,580,212
CONTROL AND MOUNTING SYSTEM FOR ELECTRIC TROLLING MOTOR
Warren D. Fortson, P.O. Box 97, Sturgis, Miss.
Continuation-in-part of application Ser. No. 771,766, Oct. 30, 1968. This application Dec. 4, 1969, Ser. No. 882,189
Int. Cl. B63h *21/26*
U.S. Cl. 115—18 **13 Claims**



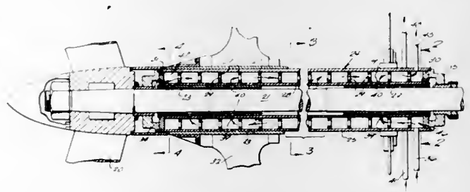
An electric outboard motor assembly and storage housing therefor including remotely disposed power and steering controls. The storage housing is constructed in a manner whereby a battery for the electric outboard motor assembly may be received therein and a voltage control is mounted on the housing and operatively connected to the battery and electric motor of the outboard motor assembly for controlling the speed of operation of the electric motor. Further, the steering control for the electric outboard motor assembly includes a pair of selectively usable steering components, one of which is removably supported from the housing and receivable in the latter for storing and the other of which is mountable directly on the outboard motor assembly and is also receivable in the housing for storage. In addition, the second mentioned steering control is provided with its own voltage control whereby one hand operation of the electric outboard motor assembly may be accomplished when the motor is being steered by the second mentioned steering control.

3,580,213
SWIMMING PADDLES
Melville J. G. Yuen, 1707 Wilhemlmina Rise, Honolulu, Hawaii
Filed Oct. 6, 1969, Ser. No. 863,931
Int. Cl. B63h *16/04*
U.S. Cl. 115—22.3 **4 Claims**



A shaft has oppositely extending offset portions at opposite ends, each portion being connected to a corresponding flotation paddle. Straps secure the shaft rotatably to a user in water. The user, using hands or feet, rotates the shaft to move the paddles and propel himself in the water. The paddles are lighter than water and act as floats as well as assisting in propulsion.

3,580,214
MARINE PROPELLER SHAFTS BEARING ARRANGEMENTS
Ernest Muller, c/o Messageries-Maritimes, AMP Building, Sydney, Australia
Filed Apr. 3, 1969, Ser. No. 813,115
Int. Cl. 308 *4*
U.S. Cl. 115—34 **13 Claims**

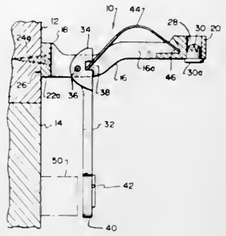


Marine propeller shaft bearing assemblies feature a double-walled stern tube which is extremely rigid in construction so as to be capable of resisting primary bending stresses before they can affect the shafting proper. The rigid stern tube permits extension for a considerable distance aft of the stern post of the vessel, thus enabling the positioning of propellers a more favorable distance from the hull to reduce vibration. The annular passage between the walls of the stern tube is utilized for the flow of cooling and lubricating fluids. The structure is applicable to single propeller shafts and counter-rotating propeller shafts.

3,580,215
BURGLAR ALARM
Paul G. Karasman, 3846 W. 26th St., Chicago, Ill.
Filed Mar. 27, 1969, Ser. No. 811,084
Int. Cl. G08b *13/08*
U.S. Cl. 116—87 **3 Claims**

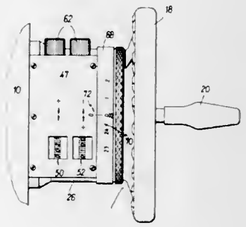
A warning device of the type intended to be utilized in connection with windows, doors and the like to give notice of unauthorized entry of the type comprising a body having means for securement to a frame adjacent the door or window and an arm hinged to the body and intended to overlie the door or the window with spring means interconnecting the arm and the body so that slight displacement of the arm causes rapid return movement thereof to the body. One of the arm or body has a striker element and the other of the

arm and body has means for receiving an audible signal means, such as a blank ammunition cartridge or the like so



that the rapid return movement will cause the striker element to engage the cartridge thereby causing the cartridge to fire.

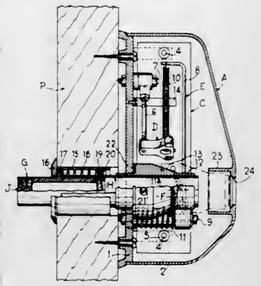
3,580,216
APPARATUS IN A MACHINE TOOL FOR INDICATING DISPLACEMENT EFFECTED BY A FEED SPINDLE
Lorenz Weber, Sussen, Germany, assignor to Gebruder Boehringer Gesellschaft mit Beschrankter Haftung, Goppingen, Germany
Filed Sept. 24, 1968, Ser. No. 761,978
Claims priority, application Germany, Sept. 25, 1967, B94645
Int. Cl. B23g *17/00*
U.S. Cl. 116—115.5 **3 Claims**



The novel apparatus in a machine tool for indicating displacement effected by a feed spindle includes at least one counter counting the number of revolutions of a rotary actuator which is driven by the feed spindle through the intermediary of motion-transmitting means including a slip clutch or the like. The actuator is connected with a manually rotatable element such as a knob and, therefore, may be manually rotated independently of the feed spindle. If desired, two such counters may be provided counting in opposite sense, one in the additive sense and the other one in the subtractive sense.

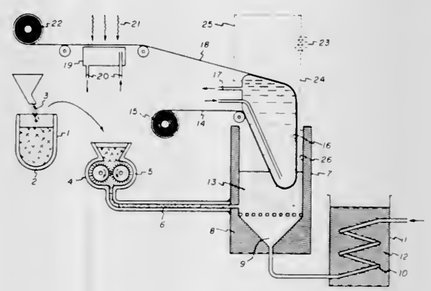
3,580,217
MECHANICALLY ACTUATED WARNING DEVICE
Jean Charles Joseph Blosse, and Michel Jean Joseph Blosse, 48 Boulevard de General de Gaulle 95, Sannois, France
Filed Nov. 29, 1968, Ser. No. 779,955
Claims priority, application France, Dec. 7, 1967, 131,294
Int. Cl. G10k *1/10*
U.S. Cl. 116—169 **12 Claims**

Mechanically actuated warning device of the doorbell type. A hammer is caused to strike sound plates by means of a push piece having a cam portion which acts on an actuating element which is drivingly connected to the hammer through elastically yieldable means forming an overcenter mechanism with the actuating element. Return means urge the actuating



element to a position of rest in which the hammer is in the vicinity of one of the sound plates.

3,580,218
APPARATUS FOR APPLYING A COATING OF ADHESIVE MATERIAL ON TO A SUPPORT
Friedrich Grundschober, Confignon, Geneva, and Joerg Sambeth, Carouge, Geneva, both of, Switzerland, assignors to Aktiebolaget Stadex, Malmo, Sweden
Filed Feb. 8, 1968, Ser. No. 704,138
Claims priority, application Switzerland, Feb. 2, 1967, 2039/67
Int. Cl. B44d *1/094, 1/44*
U.S. Cl. 118—621 **6 Claims**

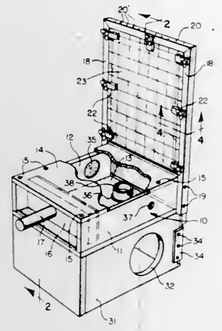


The invention provides an apparatus for applying a coating of adhesive material on to a support, e.g. a strip of paper. To apply this coating, one surface of the strip is fed over a guide surface through a fluidized bed of the adhesive material in cooled comminuted form, the bed particles which come into contact with said surface being caused to become fixed thereto.

3,580,219
INSECT INSPECTION CAGE
Robert C. Stebbins, 601 Plateau Drive, Kensington, Calif.
Filed Aug. 18, 1969, Ser. No. 850,863
Int. Cl. A01k *67/00*
U.S. Cl. 119—1 **4 Claims**

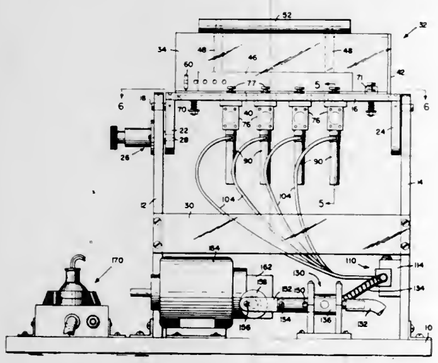
A new and useful enclosure or cage for insects, such as fruit flies (Drosophila), which is especially constructed and adapted to accommodate a colony of such insects, and to provide for such colony, an environment in which the insects may reside and multiply, and in which the insects may be subjected to experimental controls in various manners as may be desired. The enclosure or cage has at least one transparent wall, whereby the insects may be viewed, studied, counted, photographed, and otherwise observed and recorded.

The enclosure or cage has a portion into which the insects may be herded, by movement of a pistonlike wall or walls, and which has a dimension in one direction which provides accommodation for only one layer of insects in that direction, whereby all of the insects in the enclosure or cage are disposed substantially in a common plane and are thus



located immediately adjacent to a transparent wall, and, more specifically, between such wall and a source of light, which may be daylight or photoflash, in such manner as to permit photographic images or shadowgraphs of the mass of insects, so disposed, to be readily made for subsequent examination and counting.

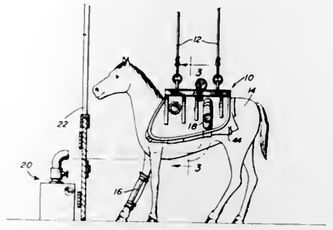
3,580,220
SMALL ANIMAL-MILKING APPARATUS
Allen D. Cook, Philadelphia, and Kalman T. Szabo, Ambler, Pa., assignors to Smith, Kline & French Laboratories, Philadelphia, Pa.
Filed Aug. 20, 1969, Ser. No. 851,678
Int. Cl. A01j *03/00, 05/00*
U.S. Cl. 119—14.01 **10 Claims**



A milking machine for rats or the like having a cage for holding the rat in a suckling position with its teats exposed and means for applying a suction to a plurality of cups which are adapted to receive teats or nipples of the rat. A valve means controls the application of suction to any desired number of cups and the suction is controlled to be provided intermittently by means of a pulsator.

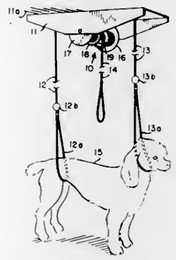
3,580,221
VACUUM SUPPORT FOR ANIMALS
Theodore A. Noyes, 320 Dunn St., Bryan, Tex.
Filed Oct. 31, 1969, Ser. No. 872,980
Int. Cl. A01k *29/00, 67/00*
U.S. Cl. 119—96 **8 Claims**

A vacuum supporter, including a rigid shell, shaped in the contour of an animal's back. A screen is attached in spaced underlying relation to the shell, the screen being adapted to contact the animal's back. A seal is positioned around the outer edge of the shell so that upon introduction of vacuum



pressure in the space between the shell and screen, sufficient suction force can be maintained. The vacuum maintains contact between the animal and the supporter when hoists lift the supporter and animal.

3,580,222
APPARATUS FOR HOLDING PETS
Jane M. Dunn, 2113 N. Pacific Ave., Santa Cruz, Calif.
Filed July 14, 1969, Ser. No. 841,410
Int. Cl. A61d *03/00*
U.S. Cl. 119—102 **6 Claims**

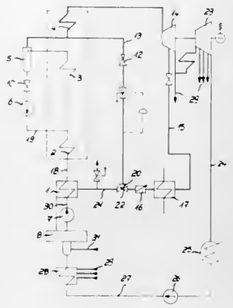


Apparatus for holding a dog or small animal in position during grooming provided with two cords having loops at the lower ends thereof for attaching to different parts of the animal. The upper parts of these cords are attached to spring-loaded reels which are supported on a shaft in a frame which is adapted to be attached to the ceiling of the dog grooming parlor. The reels are provided with members cooperating with a latch which is adapted to lock the reels in predetermined position after the looped parts of the cords are placed on the animal to hold it in grooming position. The latch is controlled by a manually operable cord attached thereto. A hook member is provided to the latch and this is adapted to be received by a locking device when the hook member is inserted therein by exerting pulling effort on the cord. Exerting further pulling effort on the cord serves to release the hook member from the locking device, thereby disengaging the latch and permitting rotation of the reels.

3,580,223
METHOD AND APPARATUS FOR OPERATION OF A POSITIVELY DRIVEN STEAM GENERATOR WITH ROLLED OVERLAP AND GASTIGHT WELDED VAPORIZER WALLS
Klaus Knizia, Nochen Uber, Englskirchen, Germany, assignor to L. & C. Steinmuller G.m.b.H., Gummersbach, Germany
Filed Apr. 24, 1969, Ser. No. 819,013
Int. Cl. F22b *29/06*
U.S. Cl. 122—1 **2 Claims**

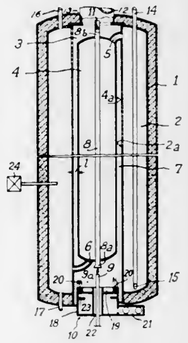
A method of and arrangement for operating a steam generator with forced circulation and with circulation overlap and gastight welded evaporator walls, in which saturated steam freed in a separator vessel is conveyed not only to suc-

ceeding superheaters, but also through a withdrawal conduit and a control valve to a heat exchanger preceding the steam generator or its evaporator, and in which the said saturated



steam is employed for heating up the feed water to a temperature which is as close as possible to the pertaining saturation temperature.

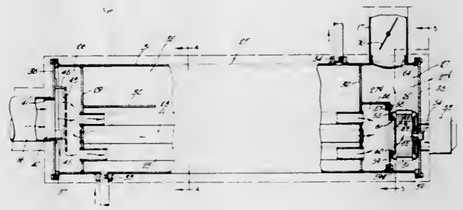
3,580,224
GAS-OPERATED WATER HEATER
James Rouet, Bois-Colombes, and Roger Vignes, Paris, France, assignors to Service National dit. Gas De France, Paris, France
Filed Aug. 6, 1969, Ser. No. 856,232
Claims priority, application France, Aug. 9, 1968, Dec. 5, 1968, 162,566;176,864
Int. Cl. F22b *7/04*
U.S. Cl. 122—16 **20 Claims**



A gas-operated water heater has a peripheral water tank surrounded by a thermally insulated jacket. A cavity within the peripheral tank contains a central water tank and an annular flue is defined between the two tanks. A burner and a pilot light are situated beneath the tanks the fumes from the burner passing through the annular flue and the fumes from the pilot light passing through a flue in the central tank. The tanks are in fluid connection and cold water may be fed to them and hot water drawn off.

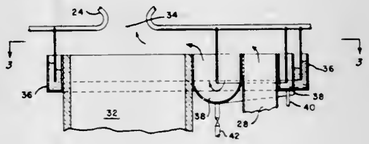
3,580,225
ECONOMIZER
John W. Coy, Exton, Pa., assignor to Coy Oil Co., Inc., Exton, Pa.
Continuation-in-part of application Ser. No. 798,406, Feb. 11, 1969, now abandoned. This application Nov. 24, 1969, Ser. No. 879,355
Int. Cl. F22b *33/00;* **F28f** *9/02*
U.S. Cl. 122—20 **13 Claims**

A heating system having a furnace with a flue and a chimney in communication with the flue for venting combustion gases to the atmosphere is provided with an economizer heat exchanger intermediate the flue and the chimney for extracting an additional quantity of heat from the combustion gases to improve the efficiency of the heating system. The economizer comprises a horizontally disposed cylindrical shell mounting a bank of tubes adjacent its bottom and having an inlet chamber at one end connected to the flue and an outlet chamber at its other end connected to the chimney, the chambers being in communication with one another through the tubes. The tubes are supported at their ends and



they are spaced apart by means of walls extending across the shell, the walls forming therebetween a cavity through which fluid is flowed upwardly across the tubes for extracting heat therefrom as the combustion gases flow through the tubes. A fan is mounted in the outlet chamber for inducing the gases to flow through the tubes and out the chimney, the fan having a greater capacity for removing the gases than the furnace has for producing them. In addition, means is provided to regulate the pressure in the combustion chamber of the furnace, the pressure being reduced below atmospheric due to the operation of the fan.

3,580,226
STEAM GENERATOR USING GAS RECIRCULATION
Samuel S. Blackburn, Jr., Avon, and Earl K. Rickard, East Granby, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.
Filed Dec. 4, 1969, Ser. No. 881,986
Int. Cl. F22g *5/06;* **F23j** *5/02*
U.S. Cl. 122—235 **4 Claims**

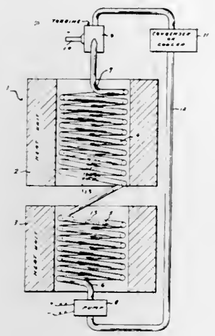


A steam-generating unit using gas recirculation for steam temperature control, where the recirculated gases are introduced into the furnace through the ash hopper. A liquid seal inside the ash hopper is used to control flow of recirculated gases.

3,580,227
BOILER INLET PLUG INSERT WITH HEAT DAMS
Alfred Koestel, Nogales, Ariz. assignor to The United States of America as represented by the Secretary of the Air Force
Filed Feb. 5, 1970, Ser. No. 8,797
Int. Cl. F22b *37/34*
U.S. Cl. 122—406R **5 Claims**

A device for eliminating the thermal instability of a liquid in forced feed convection boilers in which subcooled liquids which are introduced at the inlet have a tendency to superheat and flash into vapor to produce liquid slugs which are discharged at the outlet with the dry or superheated vapor. The invention is a rod-or sleeve-type insert located in the heating coils which produces liquid flow damping and controls the liquid superheating, and incorporates a nucleation device or devices disposed axially along the direction of

liquid flow and introduces heat dams at the nucleation sites created by vapor from the heated site to prevent the liquid



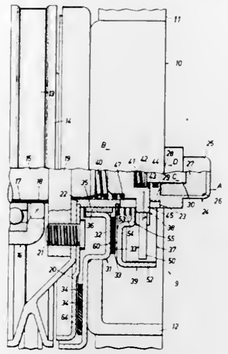
being heated from entering the nucleation site and flashing into vapor.

3,580,228
OSCILLATING INTERNAL COMBUSTION ENGINE
Octavio Rocha, Ave Tecnologies Sur #600, and Serafin Cano, Via Asinaria #315 Col. Fuentes del Valle, Monterrey, Mexico
Filed May 20, 1969, Ser. No. 826,151
Int. Cl. F02b *53/00*
U.S. Cl. 123—18 **9 Claims**

The invention hereinafter disclosed is a power unit which includes an internal or external combustion engine having an annular cylinder, arcuate pistons which oscillate in that cylinder and improved mechanism for translating the power developed in the engine to a shaft to be driven. The engine may be supplied with fuel either by injection or carburetion or by steam or fluid or gas under pressure and the arrangement is such that vibrations due to explosions of the fuel mixture or of power strokes are minimized and the output shaft is powerfully driven at uniform speed.

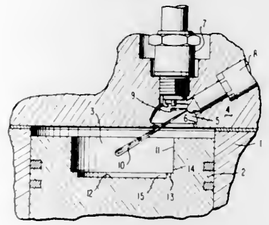
3,580,229
METHOD AND MEANS FOR SWITCHING ON AND OFF THE FAN WHEEL OF A REGULATING FAN
Michael May, Stuttgart-Berg, Germany, assignor to Fichtel & Sachs AG, Schweinfurt am Main, Germany
Filed Feb. 25, 1969, Ser. No. 802,093
Claims priority, application Germany, Mar. 1, 1968, P 16 26 008.5
Int. Cl. F01p *7/02*; **F16d** *7/00, 19/00*
U.S. Cl. 123—41.12 **8 Claims**

The cooling fan of an internal combustion engine is driven through a temperature-controlled clutch. Slipping of the clutch is held to a minimum by an auxiliary actuating mechanism which automatically moves the clutch into the



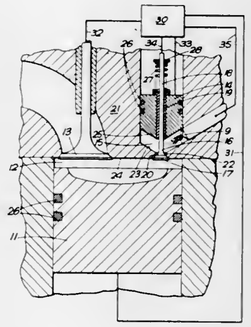
fully engaged or the fully disengaged position as soon as it has been moved by a thermostat into an intermediate position. Several examples of clutch arrangements are given.

3,580,230
AIR-COMPRESSING INJECTION-TYPE INTERNAL COMBUSTION ENGINE WITH EXTERNALLY CONTROLLED IGNITION AND QUALITY REGULATION
Heinrich Hoffmann, Stuttgart-Geroksruhe, and Wilhelm Wagner, Stuttgart-O, Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany
Filed Oct. 3, 1968, Ser. No. 764,734
Claims priority, application Germany, Oct. 5, 1967, P 15 76 008.4
Int. Cl. F02b *19/10*
U.S. Cl. 123—32SPA **23 Claims**



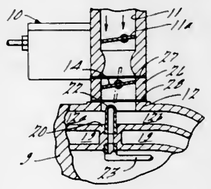
An air-compressing internal combustion engine with externally controlled ignition and quality regulation which includes an at least approximately axially symmetrical combustion space arranged in the piston, in which an air rotary movement about the combustion space axis is present toward the end of the compression stroke, and which includes an injection system which injects fuel against the wall of the combustion space approximately in the direction of the air movement and approximately tangentially with a nonnegligible free length of the jet so that the fuel thus injected into the piston combustion space flows along the walls thereof; an auxiliary combustion space is arranged in the cylinder head which includes an injection nozzle and an ignition source whereby the auxiliary combustion space has the shape of an approximately semispherically shaped recess containing about 5 to 20 percent of the entire combustion space volume; the auxiliary combustion space is arranged within the area of a circumferential place of the piston combustion space while the injection nozzle is so arranged and constructed in the auxiliary combustion space that in addition to the partial fuel quantity injected into the piston combustion space a further partial fuel quantity is injected obliquely against the wall parts of the auxiliary combustion space.

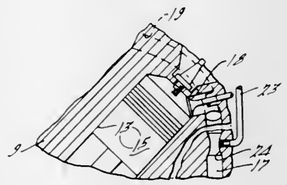
3,580,231
VALVE MECHANISMS FOR USE WITH INTERNAL COMBUSTION ENGINES
Cyril Henry Bradbury, London, England, assignor to Simms Group Research and Development Limited, London, England
Filed Feb. 11, 1969, Ser. No. 798,378
Claims priority, application Great Britain, Feb. 14, 1968, 7,251/68
Int. Cl. F02m *67/00*
U.S. Cl. 123—32 **10 Claims**



An internal combustion engine has a main cylinder and piston for receiving part of the main charge of combustible mixture for operating the engine, a subsidiary cylinder interconnected with the main cylinder by a passage, a valve controlling the passage so that part of the charge in the main cylinder passes into the subsidiary cylinder during the compression stroke of the main piston, a subsidiary piston in the subsidiary cylinder for increasing the compression of the part of the charge in the subsidiary cylinder, an additional fuel inlet to the subsidiary cylinder and a control mechanism for operating the valve, subsidiary piston and fuel inlet in timed relation.

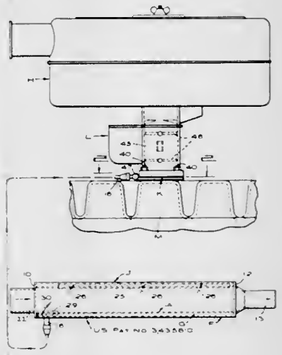
3,580,232
ENGINE EXHAUST RECIRCULATION
Jorma O. Sarto, Orchard Lake, Mich., assignor to Chrysler Corporation, Highland Park, Mich.
Division of Ser. No. 807,706, Mar. 17, 1969
Filed June 18, 1970, Ser. No. 47,488
Int. Cl. F02n *25/06*
U.S. Cl. 123—119 **7 Claims**





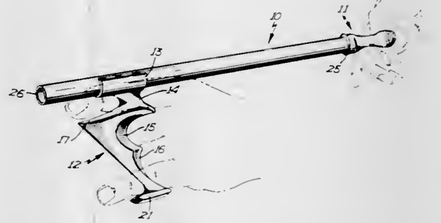
Controlled recycling of automobile exhaust gases through a bypass conduit connecting the exhaust system and the fuel and air inlet system is accomplished during various engine-operating conditions by means of a venturi in the exhaust system at its connection with the bypass conduit, and also by means of a pitot-type opening of the bypass conduit into the inlet system, the dimensions and arrangement of the venturi and pitot opening being determined to effect a reverse flow of either fresh air or a fuel-air mixture into the exhaust system (depending on the location of the pitot opening upstream of downstream of the fuel supply into the inlet system) thereby to enhance complete combustion of the exhaust gases within an exhaust reactor in the exhaust system.

3,580,233
DEVICE FOR MIXING COMBUSTIBLE COMPONENTS RECOVERED FROM EXHAUST GASES WITH FUEL CHARGE OF CARBURETOR
Ewald A. Busse, Redwood City, Calif. (151 E. St. Auburn, Calif. 95603)
Filed July 25, 1969, Ser. No. 844,977
Int. Cl. F02m *25/06*
U.S. Cl. 123—119A **3 Claims**



A device for mixing combustible components recovered from the exhaust gases of an internal combustion engine with the fuel charge of a carburetor, the device being connected to the carburetor and the intake manifold, the recovered combustible components and disposed above the fuel charge being thoroughly intermixed before they reach the manifold. This device is used in conjunction with the apparatus for utilizing exhaust gases of an internal combustion engine, muffler and spark arrestor shown in my U.S. Pat. No. 3,435,810.

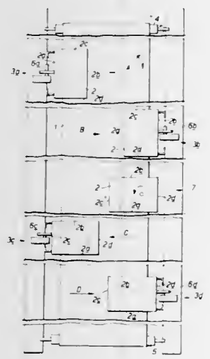
3,580,234
TOY GUN WITH STRETCHABLE DIAPHRAGM
Reynolds W. Guyer, Jr., Mendota Heights, and Wilbert A. Kruse, St. Louis Park, Minn., assignors to said Krause assignor to said Guyer d/b/a Winsor Concepts, Minneapolis, Minn.
Filed Nov. 29, 1968, Ser. No. 779,946
Int. Cl. F41b *7/08*
U.S. Cl. 124—21 **7 Claims**



A toy gun having an elongated tube with a balloon secured over the rear end of the tube and a handle secured adjacent

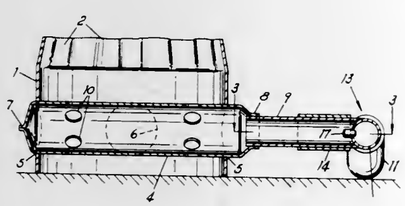
the front end of the tube so that when the handle is held in one hand the balloon may be grasped by the other hand to be stretched and then released to propel a projectile deposited in a balloon. The handle has finger grooves therein to minimize the gripping force necessary to hold the handle.

3,580,235
MANUFACTURE OF SLATES
Lazlo Lombos, Llandudno Junction, and Michael Robert Hughes, Old Colwyn, North Wales, assignors to The Dinorwic Slate Quarries Company, Limited, Port Dinorwic, Caernarvonshire, Wales
Filed July 22, 1968, Ser. No. 746,579
Claims priority, application Great Britain, Aug. 1, 1967, 35,259/67
Int. Cl. B28d *1/18, 1/32*
U.S. Cl. 125—3 **7 Claims**



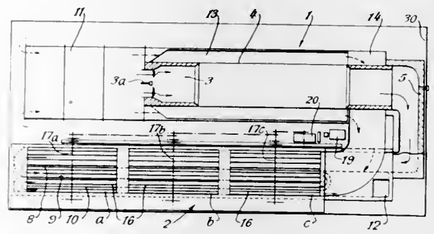
A slate-chamfering machine is disclosed which comprises at least one rotatably drivable cutting tool, the machine being adapted to present at least one edge of a substantially rectangular slate to the cutting tool, and feeding means for effecting relative movement between the cutting tool and the slate in a direction substantially parallel to the axis of rotation of the tool when the slate is presented to the tool, whereby the whole length of said edge may be roughly chamfered to achieve a "naturally broken" finish.

3,580,236
HEAT RADIATOR AND BURNER WITH ADJUSTABLE CONNECTION TO GAS SUPPLY LINE
Calvin C. Plummer, Box 333, Hastings, Mich.
Filed Oct. 10, 1969, Ser. No. 865,361
Int. Cl. A01g *13/06*
U.S. Cl. 126—59.5 **5 Claims**



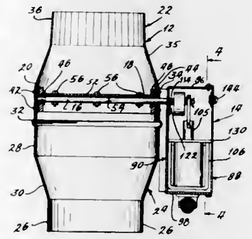
A hollow cylindrical radiator standing on end has a tubular burner extending transversely through its lower end. One end of the burner tube has a telescopic and slidably adjustable fit with a tee connector in a flexible fuel supply pipe. The stem of the tee is split to yieldably grip the end of the burner tube, and opens around the exterior of the crossmember of the tee. The end of the burner tube adjusts axially toward closing engagement with the exterior of the crossmember to adjust the air opening into the base of the tee and the end of the burner tube.

3,580,237
AIR HEATER
Alan Barsby, Lea Meadows, Gainsborough, England, assignor to Marshall Sons & Company Limited, Gainsborough, Lincolnshire, England
Filed Feb. 4, 1969, Ser. No. 796,532
Claims priority, application Great Britain, Feb. 8, 1968, 6194/68
Int. Cl. F24h *3/12*
U.S. Cl. 126—110 **9 Claims**



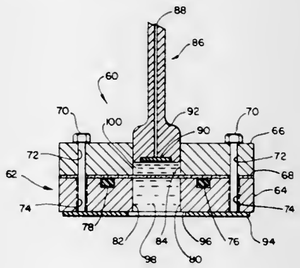
This invention relates to an air heater comprising a combustion chamber, means to supply air and a combustible fuel to the combustion chamber, an exhaust for the products of combustion from the combustion chamber, a first duct connecting the combustion chamber to the exhaust, an inlet and an outlet for air to be heated, a second duct interconnecting the inlet and outlet, said second duct surrounding the combustion chamber for part of its length and for a different part of its length being parallel to, and sharing a common boundary with, said first duct, to define a thermal regenerator, the thermal regenerator comprising a plurality of heat transfer discs extending through said common boundary into both ducts, and means to rotate each disc about its axis of symmetry.

3,580,238
AUTOMATIC DAMPER MEANS
Charles G. Diehl, North Little Rock, Ark., assignor to Save Fuel Corporation, Tunica, Miss.
Filed June 4, 1969, Ser. No. 830,431
Int. Cl. F23l *3/00*
U.S. Cl. 126—295 **8 Claims**



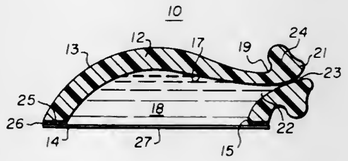
An automatic damper for use in the exhaust flue of combustion devices such as furnaces and the like to prevent undesirable loss of hot or cold air out the flue during periods when no combustion is taking place and to assure that no combustion can take place unless and until the flue is open or unrestricted. The damper has a rotatable damper plate normally biased to a closed position for preventing flow communication through the flue, motor means which when energized move the damper plate to an alternate open position to allow substantially unrestricted communication through the flue, and switch means connected in a circuit with the means that supply fuel to the combustion means, said switch means being closed when the damper plate moves to its open position to enable a combustion cycle to take place.

3,580,239
METHOD AND APPARATUS FOR IN VIVO POTENTIOMETERIC MEASUREMENTS
Hideo Watanabe, and John E. Leonard, Fullerton, Calif., assignors to Beckman Instruments, Inc.
Filed Oct. 3, 1969, Ser. No. 871,077
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.1R **4 Claims**



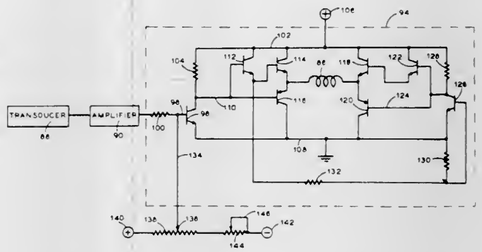
A biomedical electrode assembly for detecting electrical signals from a living subject. The electrolyte reservoir of the assembly is divided into two separate sections by a dialysis membrane. The section which is in contact with the skin of the living subject contains an electrolyte which will not irritate the skin while the other section of the electrolyte reservoir contains an electrode component and an electrolyte which cooperates with the component to produce a constant, known reference voltage. The first mentioned electrolyte is preferably isotonic saline solution and the second electrolyte is at least 3 molar potassium chloride solution.

3,580,240
DISPOSABLE ELECTRODE WITH SELF-SEALING PLUG OUTLET
Louis Ciro Cosentino, West Paterson, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.J.
Filed Jan. 17, 1969, Ser. No. 792,038
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 **5 Claims**



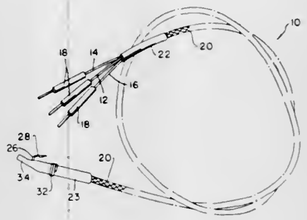
In an electrode apparatus for use in deriving electrical signals from an animal or human subject including a disposable interface unit and a reusable electrode plug unit where the disposable interface unit comprises: a unitary fabricated nonconductive member having a reservoir adapted to contain a viscous electrolyte, and outlet means extending from the reservoir to an upper surface of the member including a self-sealing closure means adapted to detachably receive the electrode plug when inserted therein.

3,580,241
CARDIOGRAPHIC APPARATUS WITH STYLUS CONTROL MEANS
Berel Weinstein, New York, N.Y., assignor to Bio-Medical Sciences, Inc., New York, N.Y.
Filed Aug. 8, 1968, Ser. No. 751,078
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 **7 Claims**



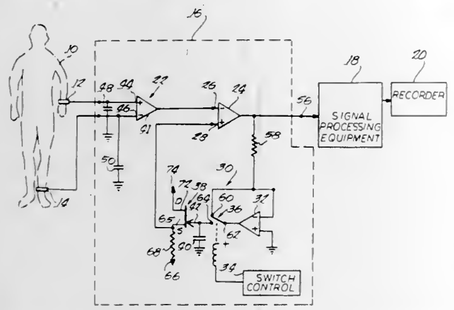
An electro- or phonocardiographic apparatus including a transducer adapted to convert the electric changes or sounds associated with the activity of the heart into corresponding graphic readings. A writing surface is provided and a stylus driven by a reversible servomotor is adapted to write on the surface. A first transistor switch connects the transducer with the motor so that the position or movement of the stylus is indicative of the heart activity as received by the transducer. A second transistor switch connects for restoring the stylus to a null position in the absence of a signal from the transducer.

3,580,242
FETAL SCALP ELECTRODE UNIT
George E. La Croix, 695 Vaughan Road, Bloomfield Hills, Mich.
Filed Apr. 1, 1968, Ser. No. 717,529
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 **3 Claims**



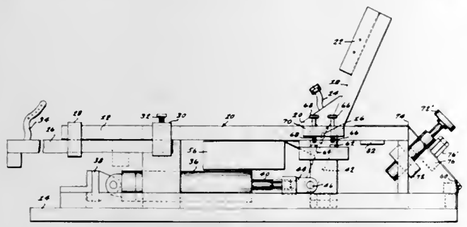
An electrode or lead unit for monitoring fetal heartbeat is disclosed which includes, in the illustrated embodiment, three electrical leads having jack connector ends to be plugged into female terminal sockets of an electrocardiogram-type recording device or audio visual or other sensing device. One of these is a ground lead electrically connected directly to an elongated, sleevelike plastic grounding sheath which internally receives the other two positive and negative electrode leads. One of the latter terminates externally of an inner end of a terminal shield of the sheath, being formed as a small pointed and barbed, relatively rigid and nonbendable penetrating electrode element, a single element similar to a fishhook, which is lightly embedded in the scalp or another skin area of the fetus during the monitoring period. The other of the positive and negative electrodes is in encircling relation to a shank part of the penetrating element. The relationship of components is such that the sheath unit make continuous grounding contact with the vaginal mucosa, so as to afford a clear tracing on the recording device throughout the period of use.

3,580,243
MEANS AND METHOD FOR SUBTRACTING DC NOISE FROM ELECTROCARDIOGRAPHIC SIGNALS
Gilbert A. Johnson, Milwaukee, Wis., assignor to Marquette Electronics, Inc., Milwaukee, Wis.
Filed Oct. 21, 1968, Ser. No. 769,314
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06B **6 Claims**



The electrocardiographic signal and a DC noise level are applied to a first of two input terminals to a differential amplifier and the output of the differential amplifier supplies the electrocardiographic signal to an output terminal without the DC noise level. To offset the DC noise level, a feedback loop from the output terminal to the second input terminal of the differential amplifier includes a sample and hold circuit that first applies the output from the differential amplifier through a nulling amplifier to a capacitor and then applies the potential on the capacitor to the second input terminal of the differential amplifier.

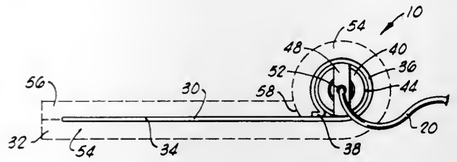
3,580,244
THERAPEUTIC DEVICE OSCILLATING DEVICE
Mary E. Graves, 4101 Providence Rd., Charlotte, N.C.
Filed Mar. 20, 1969, Ser. No. 808,828
Int. Cl. A61h *1/02*
U.S. Cl. 128—25A **5 Claims**



A therapeutic device used to relieve and prevent heel cord contractures, including a foot-supporting plate member pivotally mounted about a laterally extending axis located substantially beneath the ankle joint of the supported foot, and including a reciprocating hydraulic motor connected to the plate member to cause oscillation thereof. They hydraulic circuit for operating the motor includes a shiftable reversing valve that is selectively operable to control the angular extent of the plate member oscillations, and includes selectively adjustable flow control valves for regulating the speed of oscillation of the plate member. Additionally, the hydraulic circuit may include a selectively adjustable pressure relief valve for controlling the force applied to the supported foot by the plate member.

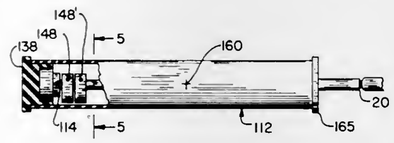
3,580,245
VIBRATORY MASSAGING DEVICE
Onnie R. Dill, 10301 Hasley Place, Oklahoma City, Okla.
Filed Feb. 3, 1969, Ser. No. 796,077
Int. Cl. A61h *1/00*
U.S. Cl. 128—33 **8 Claims**

Massaging apparatus which is capable of more effectively distributed vibratory motion, the apparatus consisting of a frame constructed of expanded metal and having a vibratory element securely affixed thereto, with a resilient padding



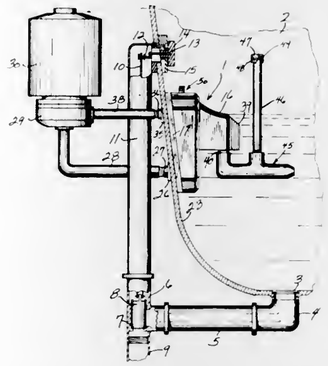
overlaying the frame structure and with a decorative outer cover removably disposed thereover.

3,580,246
MOTOR OPERATED VIBRATOR HAVING SOLAR TYPE MOTION
Dave O. Foreman, 606 E. Broadway, Andrews, Tex.
Filed Nov. 22, 1968, Ser. No. 778,255
Int. Cl. A61h *1/00*
U.S. Cl. 128—36 **3 Claims**



Motor driven apparatus, for inducing vibratory action into a person's body, comprised of a housing having a shaft rotatably journaled therein by spaced apart bearing means. Spaced apart eccentric weights placed near each bearing means and rigidly affixed to the shaft induces a circular vibratory motion in the extremities of the housing while the center of the housing remains relatively quiescent. A motor located apart from the housing rotatably drives the shaft by means of a flexible coupling member.

3,580,247
HYDROTHERAPEUTIC DEVICE
Richard C. Schneider, 701 N.E. 23rd Terrace, Pompano Beach, Fla.
Filed Sept. 12, 1968, Ser. No. 759,433
Int. Cl. A61h *9/00, 33/02*
U.S. Cl. 128—66 **9 Claims**

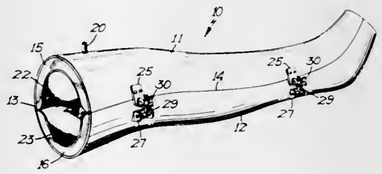


A hydrotherapeutic unit to be permanently installed with a bathtub or tank. The unit includes a manifold mounted on

the end wall of the tub and the manifold defines a water supply chamber and a return chamber. A pair of conduits extend through the end wall of the tub on opposite sides of the waste valve operating mechanism and one conduit establishes communication between the supply chamber and the discharge side of a pump located outside of the tub, while the second conduit establishes communication between the return chamber and the suction side of the pump.

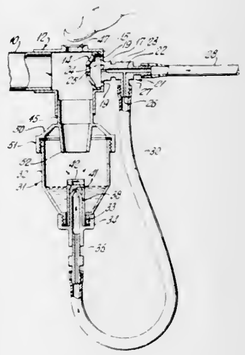
A nozzle assembly is located within the tub and is connected to the supply chamber so that water discharged by the pump is delivered to the supply chamber and then ejected under high pressure from the nozzle assembly within the body of water in the tub. The water is recirculated from the tub through the return chamber to the pump.

3,580,248
BI-VALVED CAST
Leighton W. Larson, P. O. Box 202, Waconia, Minn.
Filed Dec. 2, 1968, Ser. No. 780,335
Int. Cl. A61f *5/04*
U.S. Cl. 128—89 **8 Claims**



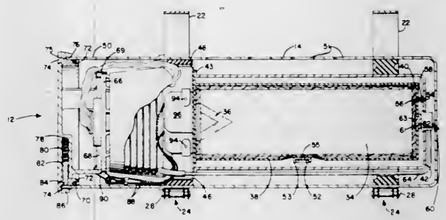
A cast for immobilizing broken limbs which includes a pair of bivalved shells, an inflatable liner in each of the shells, an absorbent liner or padding, and means for releasably securing the bivalved shells together. The cast is reuseable, permits convenient visual inspection of the broken limb without destruction of the cast, and provides for adjustment of the volume of the inside cavity and the pressure on the immobilized limb through adjustment of the inflatable liners.

3,580,249
AEROSOL NEBULIZERS
Kentaro Takaoka, Avenida Bosque de Saude No. 519, Sao Paulo, Brazil
Filed Sept. 16, 1968, Ser. No. 759,850
Int. Cl. A61m *11/02*
U.S. Cl. 128—194 **1 Claim**



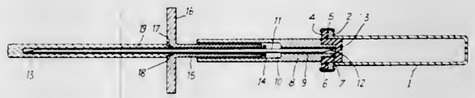
This invention relates to nebulizers designed to introduce aerosols into the respiratory systems of persons suffering from respiratory ailments.

3,580,250
OXYGEN GENERATORS
August Oroza, Santa Ana, Calif., assignor to U.S. Divers
Filed Mar. 14, 1969, Ser. No. 807,358
Int. Cl. A62b *7/08*
U.S. Cl. 128—203 **14 Claims**



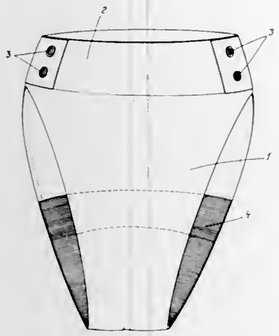
An Oxygen Generator which may be used for emergency purposes generally comprising an elongated housing for the receipt of a material which when burned produces a gas having a substantial amount of oxygen, said housing having a check valve permitting the release of the gas therefrom into a conduit connected to flexible tubing; said flexible tubing being connected to a plenum bag which feeds a face mask attached to a removable cover of the housing; said cover having a lanyard which releases hammers to fire percussion caps adjacent the oxygen-producing material of the container upon removal of said cover.

3,580,251
SELF-INJECTABLE AMPUL
Raymond Guiriec, Bourron-Marlotte, France, assignor to Societe a Responsabilite Limitee Laboraver, Longjumeau, France
Filed Apr. 11, 1969, Ser. No. 815,341
Claims priority, application France, Apr. 12, 1968, 148,075
Int. Cl. A61m *5/00*
U.S. Cl. 128—220 **7 Claims**



A self-injectable ampul comprises an ampul containing medication and sealed by a penetrable plug. A hollow needle sharpened at both ends carried by the ampul penetrates the plug, and upon continued inward movement severs the plug and carries the plug with it as a piston to eject medicant from the opposite end of the needle. The needle has an external collar mounted between the middle and the inner end thereof. A sleeve extends outwardly from the plug, surrounds substantially one-half the length of the needle, has a bore adjacent to the plug, adapted to receive a portion of the needle, and a counter bore for the remainder thereof having a diameter sufficient to receive the collar. A second sleeve having an external diameter such that its inner end can enter the counter bore in the first sleeve and an internal diameter for receiving the needle has fingers pieces extending radially outwardly therefrom at the outer end portion thereof. A sleeve extension surrounds the remainder of the needle and is removably attached to the outer end of the second sleeve. When the ampoule and the finger pieces are moved toward each other, the inner end of the second sleeve engages the collar and advances the needle so that the inner end thereof passes through the penetratable plug. The plug has a circular line of weakness so that the plug can be made to enter the ampoule and discharge the medication therefrom.

3,580,252
SANITARY TOWEL
Pierre A. Delort, 12, Avenue Marchal Foch, Nice, France
Filed Apr. 1, 1969, Ser. No. 812,236
Claims priority, application France, Feb. 20, 1969, 6,904,588
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 **4 Claims**



The invention covers a sanitary article constituted by a slip inside which is secured an absorbent lining for women's hygienic and medical purposes, said lining being constituted by superposed layers of fabric the size of which layers decreases in all directions from the outermost layer towards the innermost layer, said fabric being made at least partly of synthetic fibers welded together at a raised temperature.

3,580,253
SANITARY NAPKIN AND FLUSHABLE WRAPPER THEREFOR
Leo J. Bernardin, Appleton, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.
Filed Dec. 9, 1968, Ser. No. 782,479
Int. Cl. A61f *13/16*
U.S. Cl. 128—290 **15 Claims**

A flushable pad wrapper for sanitary napkins comprising a nonwoven web of cellulosic fibers in which the fibers are bonded together by sodium carboxymethylcellulose acidified to a pH of between 2.2 to 2.0. This wrapper has sufficient wet strength and abrasion resistance to perform satisfactorily in normal use but disintegrates readily when immersed and agitated in water.

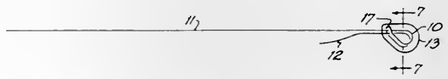
3,580,254
BANDAGE CONTAINING A MEDICINAL MATERIAL AND METHOD OF USING
Henry P. Stuart, 821-32nd Ave., Seattle, Wash.
Filed July 13, 1967, Ser. No. 653,181
Int. Cl. A61f *7/02*
U.S. Cl. 128—268 **3 Claims**

A bandage for covering a break in the skin such as a cut, a scratch or a tear. The bandage contains a medicinal material which may be released and activated after the bandage has been applied to the break in the skin. The medicinal material is contained within a capsule which is ruptured after the bandage is applied.

3,580,255
ASPIRATOR
Hugo S. Cimber, 22 Seven Gables Road, Staten Island, N.Y.
Filed Apr. 8, 1968, Ser. No. 719,659
Int. Cl. A61m *1/00*
U.S. Cl. 128—276 **8 Claims**

A disposable, sterilizable aspirator for removal of body fluids comprising a hollow needle which is mounted for axial movement within a support chamber, and is movable out of the chamber for a limited distance to penetrate a body cavity containing fluid which is to be collected. The needle may be spring-loaded. After the needle is in the body cavity, fluid may be withdrawn by connecting a syringe to the free end of a tube connected to the needle, or by a catheter passed through the hollow needle. The needle may be double-ended to penetrate a sealable diaphragm within the support chamber so that the fluid volume to be collected will be collected and covered by the diaphragm after the instrument is removed from its operating position. A bent wire can be inserted in the catheter tube to cause the tube to deflect as it leaves the end of the catheter tube.

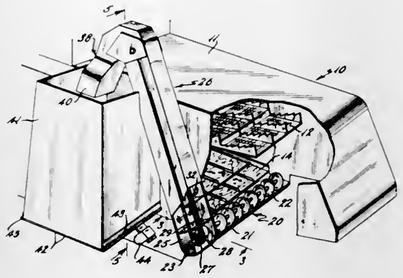
3,580,256
PRE-TIED SUTURE AND METHOD OF SUTURING
Jack E. Wilkinson, 2411 Divisadero, Fresno, Calif., and Victor G. Tahan, 1350 S. Orange Ave., Fresno, Calif.
Filed June 30, 1969, Ser. No. 837,590
Int. Cl. A61L *17/00*
U.S. Cl. 128—335.5 **8 Claims**



A surgical suture or the like including a pair of butterfly-loops secured in superimposed registering relation by a casing through which the loops are visible, and a pair of tails extending from the loops. A suturing method wherein one of the tails is used as a suture which pierces the tissue to be sutured and is passed through the superimposed loops, the tails then being pulled tight to convert the interlooping formation into a square knot.

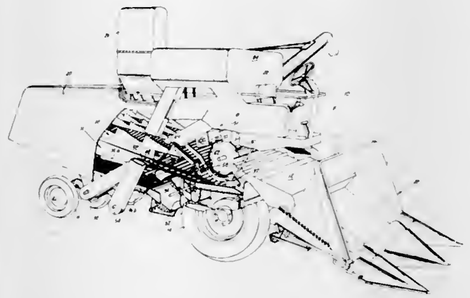
3,580,257
WEED SEED COLLECTOR FOR A THRESHER COMBINE
Earl E. Teague, Rte. 1, Box 92, Dermott, Ark.
Filed Dec. 24, 1969, Ser. No. 887,840
Int. Cl. A01f *12/42*
U.S. Cl. 130—24 **5 Claims**

Apparatus mounted on a threshing machine or combine for removing and collecting weed and other obnoxious seeds during the threshing operation so that such seeds are not distributed and replanted in the field. The apparatus includes a transverse conveyor mounted on the rear of the combine and



located at the discharge position of larger separated tailings, an inclined conveyor and a hopper into which the seeds and tailings are discharged.

3,580,258
COMBINE
Clark E. Stroburg, and Eldon L. Stroburg, Blockton, Iowa
Filed Feb. 5, 1969, Ser. No. 796,749
Int. Cl. A01f *12/48*
U.S. Cl. 130—27HF **5 Claims**

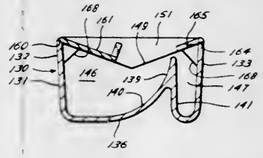


An airflow system for a combine harvester to more effectively float and carry away the straw and chaff and thus increase the efficiency of the separating and cleaning mechanism which includes strawwalkers and a cleaning shoe as is well known. This invention is designed for combines using a concave grate in relation to the threshing cylinder and includes air intake fans mounted to opposed sides of the housing to induce and direct a flow of air upwardly through the grate and over the strawwalkers and out of the machine at the rear and also over the conveyor below the grate rearwardly up the trough below the strawwalkers and then upwardly through the walkers to float the chaff and straw without preventing the heavier grain on the conveyor from reaching the cleaning shoe or the grain on the walker from falling through the openings therein onto the trough for delivery by gravity to the cleaning shoe mechanism. Preferably, two opposed streams of air are generated which impact intermediate the grate and the conveyor whereby a portion of the deflected airstream passes upwardly through the grate, over the strawwalkers and out of the rear of the machine with the rest of the deflected airstream passing up the trough, then upwardly through the strawwalkers and out of the machine at the rear. The speed of such fans may be selectively varied and likewise control means are provided for the volume of intake air.

3,580,259
TOBACCO FLAVORING
Werner Richard Gotthard Luttich, Willersweg 341, Hamburg-Langenhorn, Germany
Filed Sept. 6, 1968, Ser. No. 758,144
Int. Cl. A24b *03/12, 15/08*
U.S. Cl. 131—144 **2 Claims**

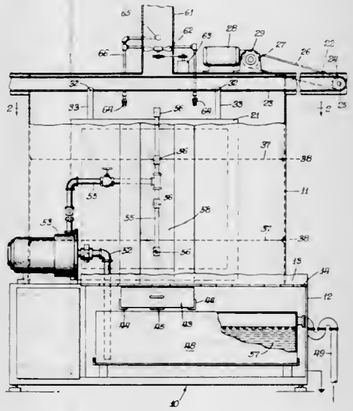
A method of influencing the smoke flavor of a tobacco by adding to the unsmoked tobacco a flavoring material which occurs in the smoke of natural tobacco, in which the flavoring material is a 2,5 - substituted pyrrole in which the 2 - substituent is selected from the group comprising; hydrogen, methyl -, and ethyl -, and the 5 - substituent is selected from the group comprising; formyl, acetyl, propionyl, carbomethoxy, carboethoxy, methylglyoxylyl, ethylglyoxylyl, and propandione - 1, 2 *l* - 1, the material being added in a quantity between 10 and 500 ppm.

3,580,260
ASHTRAY STRUCTURE
Robert D. Moore, 8124 Lockheed, Houston, Tex.
Continuation-in-part of application Ser. No. 773,994, Nov. 7, 1968, now abandoned. This application July 17, 1969, Ser. No. 847,782
Int. Cl. A24f *19/02, 19/14*
U.S. Cl. 131—242 **3 Claims**



Ashtray structures having large containers to receive the ashes and butts of cigarettes, and the like, wherein the container lid is supported inside of the container wall so that the lid is not dislodged when the container is lifted, the lid having a downwardly and inwardly sloping surface having cigarette supporting notches in an upwardly extending rim located at its lower edge for supporting cigarettes safely, the lid having an opening of limited size therethrough disposed to prevent ashes from blowing from the container. In some forms, snubbers are provided adjacent the ash and butt receptacle space.

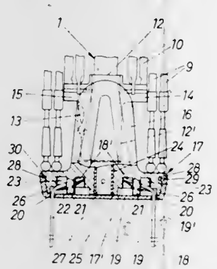
3,580,261
PRINTING SCREEN CLEANER
John W. Key, 606 Ironwood Drive, Arlington Heights, Ill.
Filed May 12, 1969, Ser. No. 823,760
Int. Cl. B08b *3/02, 15/02*
U.S. Cl. 134—104 **11 Claims**



Printing screens are carried through a tunnel by an overhead conveyor. In an enlarged central section of the tunnel

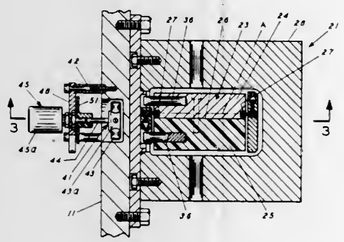
are opposed rows of spray heads to direct a cleaning solvent at the screens under pressure. A solvent with material removed from the screens drains into a removable separating tray to extract at least a portion of the material from the solvent. The solvent then drains into a sump from which it is pumped back to the spray heads. At opposite ends of the central cleaning section are entrance and exit sections having doors which are pushed aside by the screen as it is moved through the tunnel. A fan draws air in from the ends of the tunnel and discharges it out a stack. Fire quenching means has spray heads in the tunnel.

3,580,262
UMBRELLA HANDLE CARRYING STRAP ASSEMBLY
Heinz Weber, Hilden, Germany, assignor to Telesco Brophey Limited, Montreal, Quebec, Canada
Filed Apr. 30, 1969, Ser. No. 820,603
Claims priority, application Germany, May 31, 1968, P 17 57 674.8
Int. Cl. A45b *11/00*
U.S. Cl. 135—20 **7 Claims**



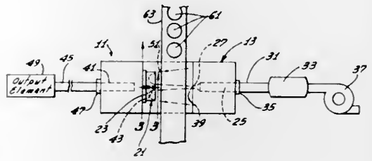
An umbrella handle having a handle gripping portion and a snap-lock cover, and a flexible carrying strap connected to the handle underneath the cover and extending therefrom.

3,580,263
PRESSURE LIQUID LEVEL INDICATOR
Walter D. Hughes, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Division of Ser. No. 650,745, July 3, 1967, Pat. No. 3,498,320
Filed June 11, 1969, Ser. No. 870,865
1969, Ser. No. 870,865
Int. Cl. F17d *3/00*
U.S. Cl. 137—2 **2 Claims**



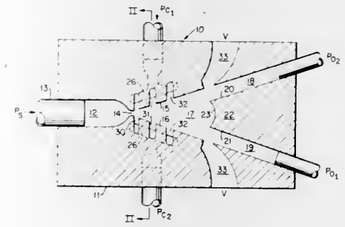
A sensor member for use in a liquid level control system for maintaining a predetermined liquid level within a vessel composed of at least two elements formed of materials of different specific gravities adapted to angularly rotate in response to deviations of the controlled liquid relative to an established elevational set-point level coincident with the location of the sensor member.

3,580,264
FLUIDIC DEVICE
Franklin C. Eickenhorst, Mason, Ohio, assignor to Dayton Reliable Tool & Mfg. Company
Filed Jan. 27, 1969, Ser. No. 794,242
Int. Cl. F15c *1/04*
U.S. Cl. 137—81.5 **11 Claims**



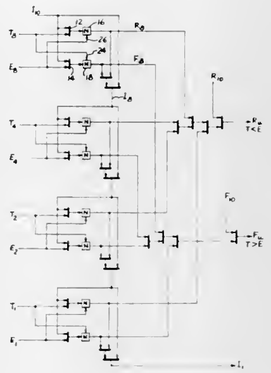
This disclosure describes a fluidic device which includes a primary supply orifice and a collector orifice with the collector orifice spaced from and generally confronting the primary supply orifice. Primary supply air is discharged from the primary supply orifice to form a primary airstream which flows into the collector orifice. To protect the primary airstream against ambient air currents, a protective fluid column at least partially surrounds the primary airstream and extends therealong to serve as a shield. The primary airstream may be disrupted or deflected in response to the presence or absence of the object which is being sensed. The presence or absence of a predetermined flow or pressure of primary air through the collector passage provides a signal indicating the presence or absence of the object.

3,580,265
BISTABLE FLUIDIC AMPLIFIER
Herbert P. Horacek, Scottsdale, Ariz., assignor to The Garrett Corporation, Los Angeles, Calif.
Filed Jan. 15, 1969, Ser. No. 794,842
Int. Cl. F15c *1/04*
U.S. Cl. 137—81.5 **7 Claims**



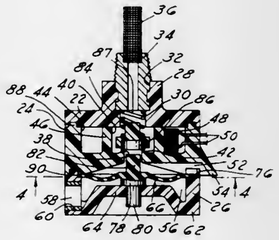
This bistable fluidic amplifier has a converging-diverging, beam- or power-jet-forming inlet nozzle, the diverging sides being extended to form an interaction chamber with laterally spaced output ports opposite the inlet nozzle. A control pressure manifold is disposed at each side of the interaction chamber and a plurality of spaced sets of control pressure inlet nozzles lead from the manifold to the interaction chamber. The control pressure inlet nozzles are of different widths and serve to distribute the control flow into the interaction chamber to deflect the power jet beam over a wide range of supply pressures. As the supply pressure is varied, the flow issuing from the inlet nozzle into the interaction region varies between subsonic, sonic and supersonic flow.

3,580,266
COMPARATOR CIRCUIT FOR DIGITAL POSITIONING CONTROL
Karl A. Brandenberg, Hayward, Calif., assignor to The Aro Corporation, Bryan, Ohio
Filed Mar. 21, 1969, Ser. No. 809,214
Int. Cl. F15c *1/12*
U.S. Cl. 137—81.5 **4 Claims**



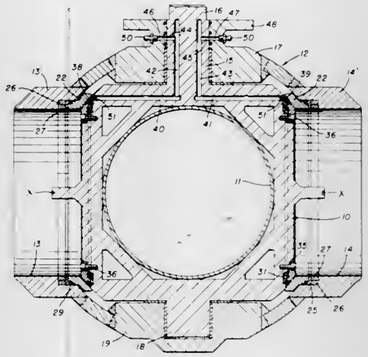
A pneumatic comparator circuit comprised of a plurality of stages arranged in serial order, each stage including a pair of pneumatic OR devices in series with a pneumatic NOT device. One of the inputs to each OR is also connected with the control input of the unassociated NOT device of the stage. Depending upon whether a signal to one or the other of the respective OR devices is present, an output signal is provided to the appropriate NOT device and finally to an ultimate output.

3,580,267
CONDENSATE VALVE
Ralph J. Baker, 655 N. Main St., Marine City, Mich.
Filed Sept. 26, 1969, Ser. No. 861,366
Int. Cl. F16k *49/00, 51/00*
U.S. Cl. 137—203 **11 Claims**



A condensate valve for connection to a compressed fluid tank, specifically an air tank associated with a compressor, to eject accumulated condensate in the tank, comprising a multiple piece valve body made of a tough, high impact plastic such as polycarbonate, each valve body section or part being internally configured to provide a passage for condensate through the valve normally closed by check valve means, and a chamber within which is disposed a diaphragm means having check valve actuating means responsive to diaphragm movement to momentarily open the check valve to exhaust condensate from the air mask.

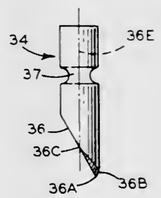
3,580,268
LUBRICANT SEAL FOR ROTARY VALVE
Homer J. Shafer, 2300 Park Ave. W., Mansfield, Ohio
Filed Sept. 10, 1968, Ser. No. 758,787
Int. Cl. F16k *5/22*
U.S. Cl. 137—246.22 **6 Claims**



A valve having a rotary valve element with an exterior seating surface substantially abutting seating elements in the upstream and downstream ends of the valve housing, there being lubricant sealing grooves in the seating surface or in the seating elements to provide lubricant seals at the upstream and downstream ends of the valve in its closed position, and separate lubricant passageways in the valve element for connecting with said sealing grooves and extending into and laterally out of the rotary valve stem, there being lateral lubricant supply ports in the stem housing for registering with said passageways in the closed position of the valve.

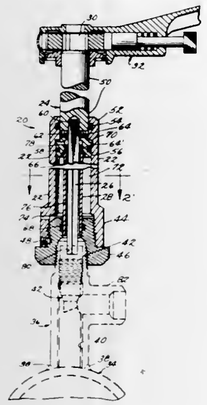
The invention relates generally to rotary valves, and more particularly to lubricant sealing construction for ball valves.

3,580,269
DEBRISLESS TAP VALVE WITH BACKRAKED PIERCING ELEMENT
Henry Ehrens, Bayside, N.Y., and Sidney Weiner, Cresskill, N.J., assignors to Sealed Unit Parts Co., Inc., Allenwood, N.J.
Filed Apr. 29, 1969, Ser. No. 820,207
Int. Cl. F16k *43/00;* **F16l** *55/00*
U.S. Cl. 137—318 **4 Claims**



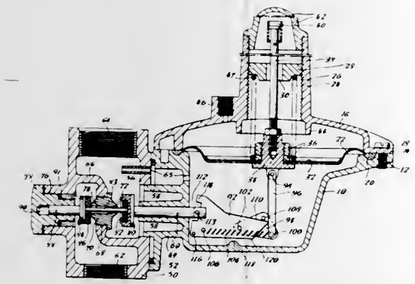
A tap valve comprises a valve body having a portion to mate with a pipeline or container to be tapped. Within the body is a valve chamber having a passageway for communication with a fluid source or sink. There is also an opening in a mating face portion of the body for communication with the pipeline or container. A threaded passageway supports a valve stem member in the body which is floatingly coupled to a piercing element. The coupling is such that axial translational motion is transmitted by the stem member to the piercing element whereas the stem member is free to rotate with respect to the piercing element. The piercing element is a truncated cylinder with a backrake along its apex edge.

3,580,270
WRENCH
Wilbur R. Leopold, Jr., and John J. Smith, Decatur, Ill., assignors to Mueller Co., Decatur, Ill.
Filed Sept. 12, 1969, Ser. No. 857,446
Int. Cl. F16k *43/00*
U.S. Cl. 137—318 **5 Claims**



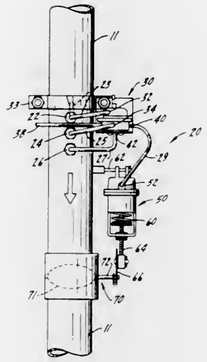
A wrench or tool, of the type disclosed in U.S. patents to Mueller et al., No. 2,829,429, granted Apr. 8, 1958 and Smith No. 3,038,484 granted June 12, 1962, and wherein the rod portion, which is operatively connectable to the part, or structure to be manipulated, in the pressure chamber, is detachably connected to the piston-carrying plunger and a tubular sleeve is also detachably connected to the plunger in surrounding relation to the rod portion defining an annular passageway communicating with a chamber on one side of the piston whereby pressure from the region being worked will be utilized to assist positioning and operation of the wrench. The rod portion is solid, and the tubular sleeve is arranged coaxially therewith.

3,580,271
GAS PRESSURE REGULATORS
Sydney Farrer, Sheffield, England, assignor to The Bryan Donkin Company Limited, Chesterfield, England
Filed Dec. 13, 1968, Ser. No. 783,652
Int. Cl. F16k *17/64*
U.S. Cl. 137—458 **3 Claims**



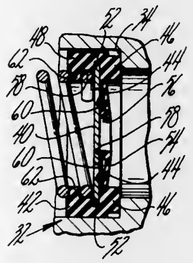
A diaphragm operated gas regulator has an operating spindle carrying a regulator valve member and a cutoff valve member respectively able to close a pair of orifices arranged back-to-back so that the cutoff valve member provides low-pressure cutoff, the connection between the operating spindle and the diaphragm including a spring loaded overcenter trip linkage so that when gas pressure becomes excessively high the linkage trips to "break" the connection and to close the cutoff valve so as also to provide high-pressure cutoff.

3,580,272
AUTOMATIC AIR FLOW REGULATOR
Russell G. Sherman, la Verne, and Robert P. Koenig, Torrance, Calif., assignors to Powers Regulator Company, Skokie, Ill.
Filed Aug. 14, 1969, Ser. No. 849,966
Int. Cl. G05d *7/03*
U.S. Cl. 137—486 **3 Claims**



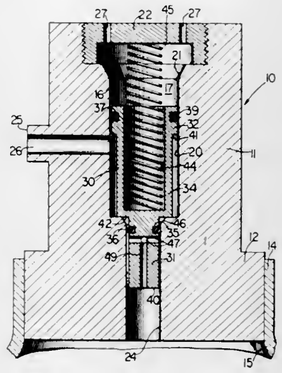
An automatic air flow regulator for use in the airline of a pneumatic tube system for automatically maintaining a preset velocity of air flow within the airline regardless of the load contained throughout the pneumatic tube system comprising a sensing means adapted to sense the pressure velocity of the air in the airline and a control means connected to the sensing means for regulating the velocity of the air flowing through the airline in response to the sensing means.

3,580,273
TWO-WAY CHECK VALVE
Ernest I. Schwarz, Middletown, Conn., assignor to The EIS Automotive Corporation, Middletown, Conn.
Filed Mar. 20, 1969, Ser. No. 808,934
Int. Cl. F16k *17/18*
U.S. Cl. 137—493.2 **1 Claim**



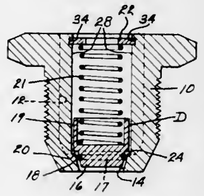
A two-way check valve comprising a diaphragm and metal disc unit for use particularly in association with the discharge port of a master cylinder for a vehicle-braking system. Flow outwardly of the cylinder in the braking stroke is accommodated through the disc and diaphragm while flow around the unit is prevented, and flow inwardly of the cylinder during the return stroke is accommodated around the unit while flow through the unit is prevented.

3,580,274
COMBINED PRESSURIZING AND RELIEF VALVE FOR FIRE EXTINGUISHERS
Arne Hansen, New York, N.Y., assignor to Walter Kidde & Company, Inc., Belleville, N.J.
Filed Dec. 2, 1968, Ser. No. 780,400
Int. Cl. F16k *17/18*
U.S. Cl. 137—493 **3 Claims**



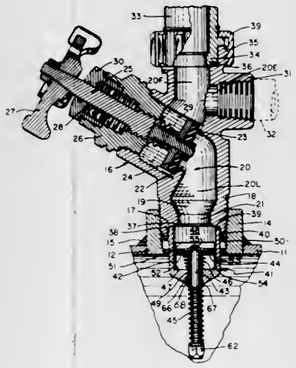
A combined pressurizing and relief valve in the control head of a fire extinguisher including a spring-biased valve member controlling flow between the external fill port and the pressure vessel of the extinguisher and between the fill port and venting openings. The valve member is provided with a small piston area in communication with the pressure vessel for operating the valve to allow excessive pressure within the vessel to flow out through the fill port. The valve member is also provided with a large piston area in communication with the fill port for operating the valve first to allow charging fluid entering the fill port to flow to the pressure vessel and, when the vessel is properly pressurized, to further operate the valve to allow the charging fluid to flow out through the venting openings.

3,580,275
VALVE
John R. Hanson, and Karl B. Pierson, Warren, Pa., assignors to Tiona-Betts, Inc., Warren, Pa.
Filed Feb. 24, 1969, Ser. No. 801,321
Int. Cl. F16k *15/02*
U.S. Cl. 137—516.29 **1 Claim**



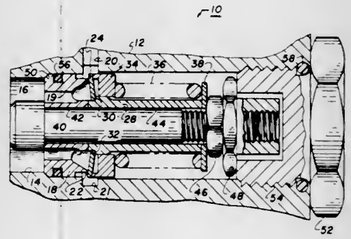
A combination pressure relief and check valve including an elongated valve body having a longitudinal bore therethrough with a tapered restricted bore portion at one end thereof forming a tapered valve seat. Reciprocably disposed in the bore is a valve disc having a tapered end portion which contacts the tapered valve seat to form a fluid-sealing engagement therewith. The disc tapered portion may have an annular O-ring disposed circumferentially thereon to provide a positive fluid seal with the valve seat. A coiled spring is longitudinally disposed in the bore and is compressed between the disc and a spring retainer locked in the opposite end of the bore to bias the disc against the seat in a normally closed position. An annular bore shoulder is formed at the juncture of the bore and the restricted bore portion, and the disc is formed with a coacting disc shoulder to seat against such bore shoulder to restrict travel of the disc into the tapered seat. The bore wall has elongated longitudinal ridges formed therein to guide the disc in the bore and to permit escape of pressurized fluid past the valve seat and through the spaces between the ridges to the atmosphere.

3,580,276
MULTIPURPOSE LIQUID TRANSFER VALVE
Christ P. Korbilas, Chicago, and Raymond W. Smith, Park Ridge, Ill., assignors to Astro Controls, Inc., Chicago, Ill.
Filed Jan. 23, 1969, Ser. No. 793,527
Int. Cl. F16k *11/00;* **F11k** *21/00*
U.S. Cl. 137—517 **10 Claims**



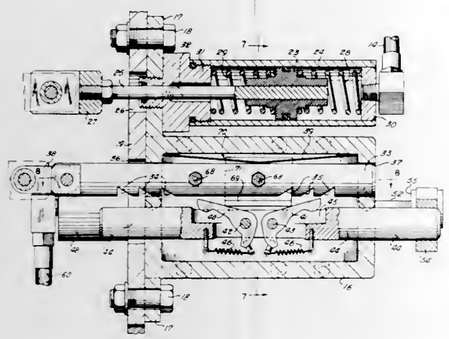
A flow control three position dual spring controlled valve which snaps shut as an excess flow check valve with flow in one direction through a shutoff valve with high degree of accuracy, and, with flow in the opposite direction, accommodates maximum flow capacity permitted by the shut off valve. The flow control valve preferably is protectively disposed within a tank and is constructed to withstand without damage the hammerlike blows of valve ports rapidly propelled in their action.

3,580,277
RELIEF VALVES WITH CONTROLLED PRESSURE OVERRIDE
Roger W. Gettel, Bloomfield Hills, Mich., assignor to Sperry Rand Corporation, Troy, Mich.
Filed Mar. 12, 1969, Ser. No. 806,488
Int. Cl. F16k *15/14*
U.S. Cl. 137—525.5 **10 Claims**



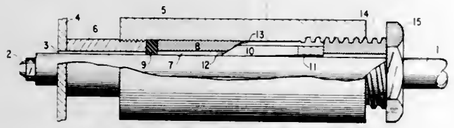
A contaminant-resistant relief valve comprising a housing having an inlet connected to an outlet with a preloaded, disc-type valve adapted to prevent communication between said inlet and said outlet below a predetermined pressure setting and means for resiliently biasing said disc-type valve, said means being of an adjustable nature.

3,580,278
FLUID-ACTUATED TRANSMISSION CONTROL
Lewis D. Bennett, Dallas, Tex., assignor to Bennett Enterprises, Inc., Addison, Tex.
Filed July 2, 1969, Ser. No. 848,377
Int. Cl. F16k *37/00, 31/44*
U.S. Cl. 137—554 **11 Claims**



A pneumatic or hydraulic control mechanism for power shift transmissions of the type used in heavy duty power equipment, such as earth moving machines, cranes and material handling devices, marine equipment, deep well drilling rigs, and the like, whereby to control the movement of the range selector valve and insure proper function thereof when shifting from one transmission range to another, thus avoiding transmission failures, and possible damage thereto, through faulty manual shifting.

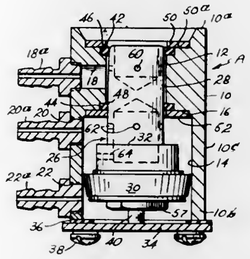
3,580,279
LOCK AND SEAL MEANS FOR LONGITUDINALLY MOVABLE MEMBER INSERTED INTO A VESSEL
Dale K. Harris, Monroe, La., assignor to Cities Service Company, New York, N.Y.
Filed Dec. 23, 1968, Ser. No. 786,180
Int. Cl. F16l *27/12*
U.S. Cl. 137—590 **16 Claims**



In a fluid-containing vessel having a longitudinally movable elongated member which extends into the vessel through an opening in the wall thereof, means for altering the insertion distance of the member while preventing leakage of material through the wall opening. The elongated member, e.g. a conduit or probe, extends axially through a stationary housing attached to the vessel wall. The housing contains a plurality of clamping fingers for gripping the elongated member so that it is secured from longitudinal movement. The grip can be released at will for repositioning of the member. Seal means is also employed to prevent leakage of material into or out of the vessel through the wall opening.

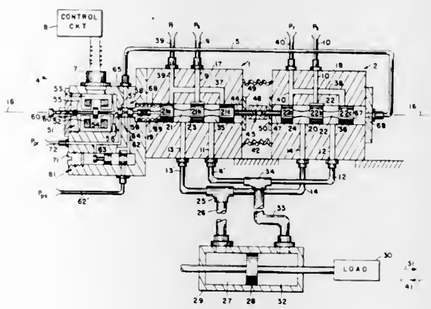
3,580,280
PISTON VALVE
Robert D. Reis, Hingham, Mass., assignor to United Electric Controls Company, Watertown, Mass.
Filed Oct. 10, 1969, Ser. No. 865,458
Int. Cl. F16k *11/10;* **F15b** *11/00*
U.S. Cl. 137—596.14 **11 Claims**

A valve block containing axially aligned chambers one of which contains a port midway between its ends and the other three ports, two at one end and one at the other. A piston is mounted in the chambers for movement axially therein. The piston has a head to which pressure is adapted to be supplied through one of the ports to shift the piston axially and a stem containing ports which in one position of the piston permits flow of pressure fluid through the valve and in the other position blocks flow through the valve. In conjunction two such



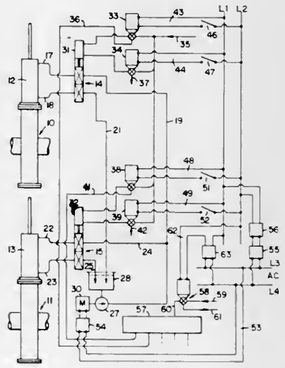
valves and a pilot valve connected thereto so that pressure supplied to the head of one valve, shifts the piston therein from a normally closed to an open position, which, in turn, supplies pressure to the head of the other valve which is normally open to shift the piston therein to a closed position, provide for switching the pressure from a source of pressure to one or the other of two activities.

3,580,281
CONTROL VALVE
Rudolph S. Petersen, Brookline, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.
Continuation of application Ser. No. 688,771, Dec. 7, 1967, now abandoned. This application Oct. 7, 1969, Ser. No. 866,105
Int. Cl. F16k *21/00;* **F01b** *23/02;* **F15b** *13/043*
U.S. Cl. 137—596.16 **11 Claims**



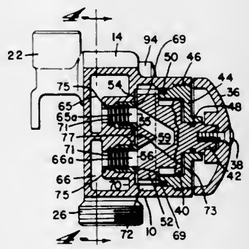
A plurality of spool-type valves are cascaded in tandem so that the spools of the valves are connected and respond to an input control force derived from a control mechanism, which is applied to one spool which acts against a bias force exerted on another spool so that the spools are positioned in unison and one spool delivers position feedback to the control mechanism so that the valves uniformly meter fluid flow at substantially the same pressure to a power actuator, whereby a signal power actuator may receive the total flow from all of the valves.

3,580,282
VALVE-OPERATING SYSTEM
Lyle R. Van Arsdale, and Francis M. Lathrop, II, Houston, Tex., assignors to M & J Valve Company, Houston, Tex.
Continuation-in-part of application Ser. No. 719,338, Apr. 8, 1968, now abandoned. This application Oct. 24, 1968, Ser. No. 770,270
Int. Cl. F17d *1/00*
U.S. Cl. 137—608 **2 Claims**



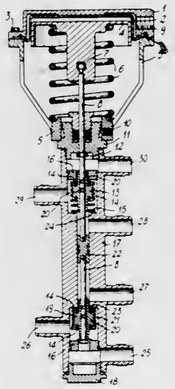
A system including power operators for two or more main flow control valves. Devices (e.g., four-way valves) serve to control supply of energy (e.g., liquid under pressure) to the power operators, and in turn are conditioned by electrical means. In the event of failure of the electrical power supply, both of the control devices are set whereby the main valves are moved to or remain in a safe condition (e.g., closed).

3,580,283
SINGLE LEVER VALVE FOR AUTOMATIC WASHERS
Robert W. De Vries, Grand Rapids, Mich., assignor to Wolverine Brass Works, a Division of Wolverine Industries, Inc., Grand Rapids, Mich.
Filed Jan. 24, 1969, Ser. No. 793,689
Int. Cl. F16k *11/06*
U.S. Cl. 137—625.18 **11 Claims**



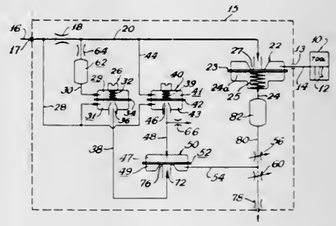
The valve is a single-lever shutoff valve for simultaneously terminating flow of hot and cold water supplied to an automatic washer or similar machine. The valve embodies a minimum number of simple and inexpensive parts, and is operable with great ease and despatch, to discourage the hazardous practice of leaving the machine elements pressured with hot and cold water when not in use.

3,580,284
REGULATING VALVE FOR WATER MIXING IN AIR CONDITIONING SYSTEMS
Giancarlo Bini, and Gianfranco Tamoni, Milano, Italy, assignors to Carlo Gavazzi S. P. A., Milano, Italy
Filed Apr. 2, 1969, Ser. No. 812,769
Claims priority, application Italy, Apr. 3, 1968, 14,762A/68
Int. Cl. F16k *31/165, 11/00*
U.S. Cl. 137—625.18 **2 Claims**



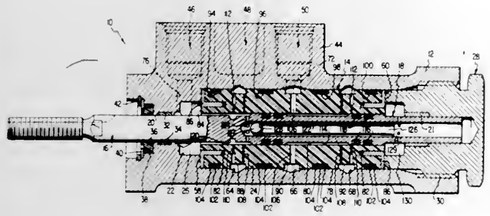
Regulating valve for hot and cold water mixing in air-conditioning systems, comprising as a unit two three-way valve bodies having a single servomotor and stem for operation thereof, such that a substantial overall size reduction is provided in air-conditioning cabinet manufacturing, the valve being controlled by a pneumatic regulator responsive to temperature, moisture or pressure conditions.

3,580,285
WORK CONTROL DEVICE FOR FLUID DRIVEN APPARATUS
Karl A. Brandenberg, Hayward, Calif., assignor to The Aro Corporation, Bryan, Ohio
Filed Aug. 28, 1969, Ser. No. 853,632
Int. Cl. F15b *11/02*
U.S. Cl. 137—624.2 **8 Claims**



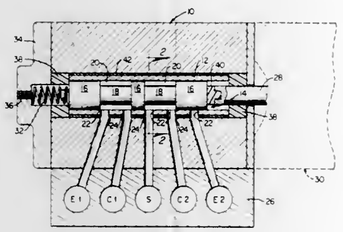
A device for controlling the amount of work performed by a pneumatic tool including a pair of sensors adapted to sense the pressure drop caused by a restriction in a pneumatic line to the tool. The sensors produce signals that are summed thereby providing a pressure supply through a metered orifice whenever the tool begins work output. The metered orifice delays the pressure supply signal to a valve in the pneumatic line downstream from the restrictor in that line. The valve closes upon receipt of the pressure supply signal thereby stopping the tool. The sensors and orifices the device are adjustable in order to compensate for various work tools, workloads and time of operation of the device.

3,580,286
SPOOL VALVE
Sidney D. Bash, Indianapolis, Ind., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed Apr. 4, 1969, Ser. No. 813,689
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.68 **5 Claims**



A unitary sleeve member formed of a nylon-molybdenum disulfide composition is fixedly carried in concentric fashion intermediate of the valve casing and a reciprocating valve spool and in contact with the peripheral surface of the valve spool.

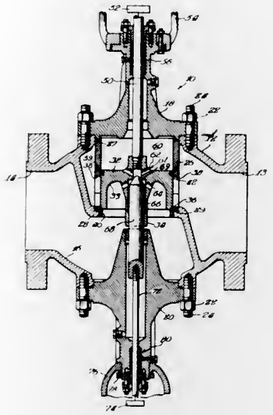
3,580,287
DIRECTIONAL CONTROL VALVE
William I. McLaughlin, Littleton, Colo., assignor to C. A. Norgren Co., Littleton, Colo.
Filed Feb. 10, 1969, Ser. No. 798,087
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.69 **9 Claims**



A spool-type valve and process of making same characterized by a ceramic spool member and ceramic sleeve which slidably receives same, the sleeve being bonded to the bore of a valve housing by an annular elastomeric wall which may be internally stressed between its bonded surfaces to prevent distortion of the sleeve in the event of temperature differences between the housing and sleeve or due to age warping of the housing. Since the elastomeric material is applied by injection and may fill an annular space of variable radial width, the dimension and finish of the housing bore and outer surface of the sleeve need not be held to critical tolerances.

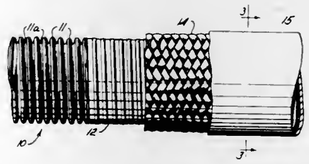
3,580,288
FLOW CONTROL DEVICE INCLUDING A PRESSURE-BALANCED SINGLE-SEATED VALVE PLUG
Charles B. Schuder; Victor E. Skov, and Richard F. Lytle, Marshalltown, Iowa, assignors to Fisher Governor Company
Filed Oct. 18, 1968, Ser. No. 768,852
Int. Cl. F16k *11/22*
U.S. Cl. 137—630.13 **5 Claims**

A flow control device providing for large flow capacity together with tight shutoff by the use of large pressure balanced single-seated valve plug having passage means therethrough, with a separate single-seated valve plug for opening and closing the passage means, the large valve plug



being opened and closed with a minimal force output actuator.

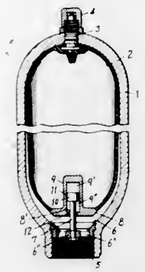
3,580,289
FLEXIBLE HOSE CONSTRUCTION
Ralph E. James, Jr., Wyomissing, and Robert B. Koch, Reading, Pa., assignors to The Polymer Corporation
Filed Jan. 9, 1967, Ser. No. 607,985
Int. Cl. F16l *11/04, 11/18*
U.S. Cl. 138—121 **1 Claim**



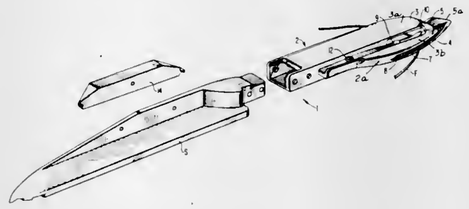
Corrugated flexible hose structure including one or more of the following features: a compressible filler material in the grooves of the hose sidewall for controlling sidewall flexure; a high tenacity yarn in the grooves; a braided covering bonded only to the crests of the ridges between the grooves; methods for filling the grooves; and methods for applying and bonding the braided covering.

3,580,290
ACCUMULATOR
Kazuo Sugimura, and Nobuyuki Sugimura, 1416 Sodeshi-cho, Shimizu-shi, Shizuoka-ken, Japan
Filed May 27, 1969, Ser. No. 828,120
Claims priority, application Japan, June 1, 1968, 43/37716
Int. Cl. F16l *55/04*
U.S. Cl. 138—31 **3 Claims**

An accumulator comprises a rigid container having a valve seat at its fluid inlet and a bladder therein carrying a valve element that engages the valve seat when the bladder is fully expanded. There is a dashpot connection between the valve element and a fixed spider in the inlet, to guide the valve element and so retard its motion when it is near the valve seat as to encourage radial rather than axial expansion and contraction of the bladder, thus preventing rubbing of the bladder on the container.



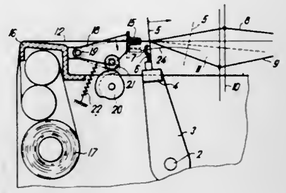
3,580,291
FILLING CARRIER FOR USE IN SHUTTLELESS LOOMS
Mario Piccoli, Gazzaniga, Italy, assignor to Somet S.p.A. Societa Meccanica Tessile, Gazzaniga, Italy
Filed Aug. 5, 1968, Ser. No. 750,267
Claims priority, application Italy, Sept. 19, 1967, Mar. 6, 1968, 20,635/67;13,607/68
Int. Cl. D03d *47/20*
U.S. Cl. 139—122 **1 Claim**



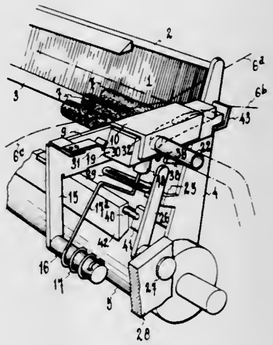
A feeding gripper that transfers weft yarn to a drawing gripper in the warp sheds of a shuttleless loom comprises an open box-type structure or main body of plastic with a laterally projecting front wing. The wing is bifurcated by a forwardly opening horizontal slot, into superposed lower and upper jaws that receive between them the weft yarn. The upper jaw is in two laterally spaced portions one of which extends forwardly from the forward end of the main body and the other of which, at a lower level, overlies the lower jaw. The forward ends of the two portions of the upper jaw are interconnected by a downwardly laterally outwardly inclined portion, and a vertical fin having a forwardly downwardly inclined upper edge is disposed on the inner side of the forward end of the lower jaw. A resilient yarn-checking device is provided on the lower jaw, between the two portions of the upper jaw, comprising metallic laminae and an adjustable leaf spring which presses them against the lower jaw.

3,580,292
APPARATUS AND METHOD FOR POSITIONING WARP SHEDS
Zdenek Rambousek, Liberec, Czechoslovakia, assignor to Elitex, Zavody Textilniho Strojirenstvi, Liberec, Czechoslovakia
Filed June 2, 1969, Ser. No. 829,374
Claims priority, application Czechoslovakia, June 3, 1968, PV4069-68
Int. Cl. D03d *49/00*
U.S. Cl. 139—190 **7 Claims**

During weaving of a fabric and during reciprocation of a race comb for a gripper shuttle along a part-circular path with the slay, reciprocating guide means move a fabric portion with an open warp shed transversely to the path of the race comb so that the race comb is entered into the warp shed near the front position thereof, and is located substantially at the center of the warp shed when arriving at its rear position in which a gripper shuttle is picked through the race comb and warp shed.



3,580,293
WEAVING MACHINE
Theodorus Fransen, Deurne, Netherlands, assignor to N. V. Machinefabriek L. Te Strake, Deurne, Netherlands
Filed Sept. 3, 1968, Ser. No. 756,973
Claims priority, application Netherlands, Sept. 15, 1967, 6712677
Int. Cl. D03d *49/70*
U.S. Cl. 139—303 **5 Claims**

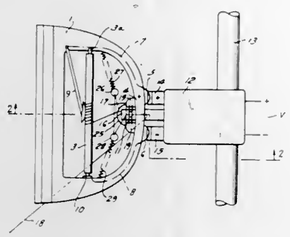


A suction nozzle is movably mounted at one side of the shed of the loom, and is provided with mechanism for displacing the suction nozzle, in synchronism with a beating movement of the reed, from an active position for receiving the free end of a weft to an end position. A locking device is provided for retaining the suction nozzle in such end position during the succeeding reverse movement of the reed, and apparatus is provided for releasing the locking device at the beginning of a succeeding reverse movement of the reed to permit the suction nozzle to return to its active position.

3,580,294
METHOD AND APPARATUS FOR DETECTING AN UNDESIRED CONDITION OF A SHUTTLE-CARRIED WEFT YARN
Jakob Muller, 5262 Frick, Aargau, Switzerland
Filed Jan. 23, 1969, Ser. No. 793,617
Claims priority, application Switzerland, Jan. 24, 1968, 1106/68
Int. Cl. D03d *51/34, 45/10*
U.S. Cl. 139—371 **8 Claims**

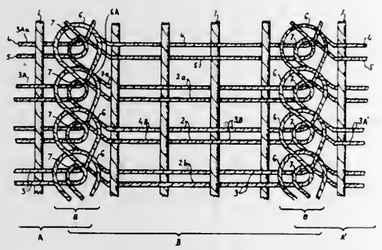
Running out of the weft yarn of a bobbin carried by a shuttle, or breakage of the weft yarn, are sensed independently, and upon sensing of such a condition, the respective sensing means moves to a control position. In at least one end position of the shuttle, an actuated sensing means in the control

position engages in the beat-up position of the slay, stationary contact means or switch means for closing a control cir-



cuit so that a control impulse for stopping the loom is produced.

3,580,295
PARTLY WOVEN AND PARTLY KNITTED FABRIC AND APPARATUS FOR MAKING THE SAME
Miloslav Jisa, Liberec; Josef Zmatlik; Josef Mohelnicky, and Bohumil Milichovsky, Prague, Czechoslovakia, assignors to Stantni Vyzkumny Ustav Textilni, Liberec, Czechoslovakia
Filed Dec. 23, 1968, Ser. No. 786,863
Claims priority, application Czechoslovakia, Dec. 22, 1967, 9120/67
Int. Cl. D03d *25/00*
U.S. Cl. 139—383 **11 Claims**

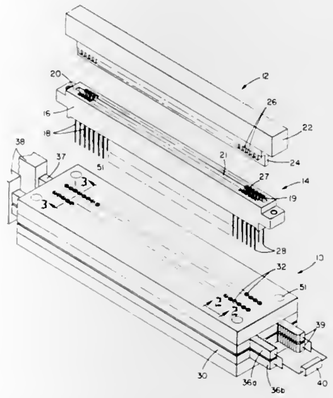


Longitudinal fabric sections, each of which include a group of warp threads and sectional double-weft elements, are connected to each other by a wale of chain stitches extending between two woven fabric sections in warp direction and tying the end loops and connecting loops of the double-weft elements of the adjacent fabric sections.

3,580,296
ARTICLES WOVEN FROM NONEXTENSIBLE MATERIALS
Ernest P. Carter, Durham; Robert P. Bell, Jr., Cary, and Alton P. Carroll, Jr., Durham, N.C., assignors to Monsanto Company, St. Louis, Mo.
Filed July 11, 1968, Ser. No. 744,078
Int. Cl. D03d *15/02*
U.S. Cl. 139—425 **6 Claims**

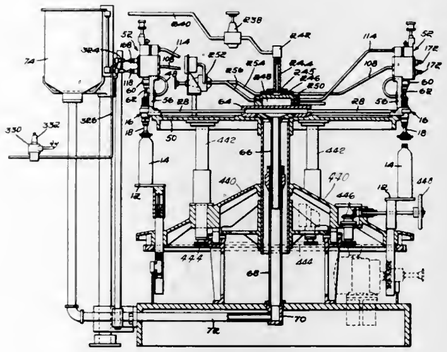
A method and apparatus for weaving a composite fabric having a mixed warp of alternating ends of extensible and nonextensible yarns, and a fill of a flexible, extensible yarn.

3,580,297
DEVICE FOR TWISTING AND ALIGNING TERMINAL POSTS OF AN ELECTRICAL CONNECTOR
Frank G. Spadoni, Jr., Orange, N.H., and Michael P. Kleban, Oakville, Conn., assignors to Litton Precision Products, Inc., Beverly Hills, Calif.
Filed Sept. 18, 1968, Ser. No. 760,404
Int. Cl. B21f *7/00, 1/02*
U.S. Cl. 140—149 **6 Claims**



A device for twisting as well as aligning the terminal posts of an electrical connector is disclosed. The device comprises a number of tubular elements located to correspond to the terminal posts of a connector and having interior cross sections similar to the cross sections of the posts. Each tubular element has a small pinion gear attached thereto and is located to operate with a rack so that the rack can impart rotational motion to the tubular elements. A second embodiment comprises laterally extending arms connected to the tubular elements which are movable for imparting rotational motion.

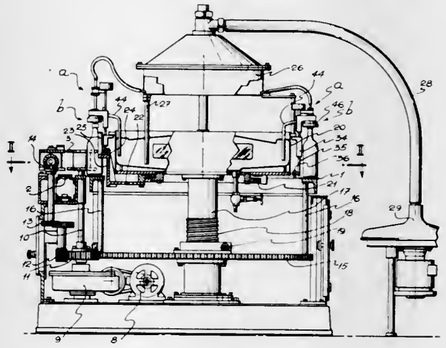
3,580,298
CONTAINER FILLING MACHINE
William H. Trusselle, Braintree, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.
Continuation of application Ser. No. 550,390, May 16, 1966, now abandoned. This application Sept. 12, 1969, Ser. No. 857,593
Int. Cl. B65b *3/26*
U.S. Cl. 141—40 **15 Claims**



A container filling machine provided with a plurality of filling heads having provision for automatically starting and

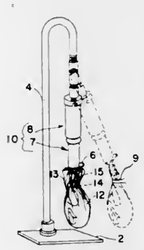
stopping the filling operation in successive filling heads which includes pneumatically operated control means for each filling head for detecting a predetermined height of the material in its container and pneumatically operated means responsive thereto for discontinuing the filling operation, the invention being characterized by improved control means facilitating adjustment of the control units for the various filling heads to obtain uniform filling heights in successive containers.

3,580,299
CONTAINER FILLING DEVICE
Jorge Alkalay, and Oton Alkaly, Ramon Lista 5376, Buenos Aires, Argentina
Filed Nov. 21, 1968, Ser. No. 777,819
Int. Cl. B65b *31/00*
U.S. Cl. 141—59 **9 Claims**



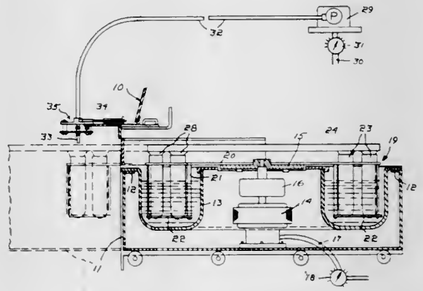
A vacuum operated bottle filling device which includes a rotating platform and rotating reservoir tank. Container filling heads are positioned on the circumferential surface of the tank and include upper and lower head pieces adapted to cooperate to fill each container to a desired level without the operation of internal or external valves thus increasing the efficiency and simplifying the construction in relation to prior art apparatus of this type.

3,580,300
VACUUM APPARATUS AND SNORKEL NOZZLE
William H. Dunn, Jr., Spartanburg, S.C., assignor to W. R. Grace & Co., Duncan, S.C.
Filed July 25, 1969, Ser. No. 844,887
Int. Cl. B65b *31/04*
U.S. Cl. 141—65 **6 Claims**



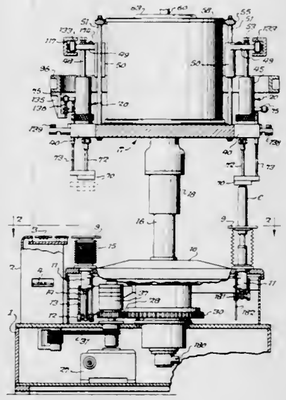
A vacuum operated device for withdrawing air from a package, lifting the package and positioning the package for closing. The device includes only a few parts and has two main assemblies connected by a quick clamp. The parts may be disassembled and assembled by hand without the use of tools for cleaning. One of the assemblies has two subassemblies, an axial suction tube and an axial slide handle which are mounted in the first vacuum chamber and the other assembly includes a piston and a cylinder. A vacuum nozzle is provided having a sump. A new vacuum operated apparatus construction is also provided wherein a permanently open relief vent is present.

3,580,301
CONTINUOUS FLOW LIQUID DISTRIBUTING SYSTEM
Samuel Nejame, Jr., Medfield; George C. Kondel, Jamaica Plain, and Italo J. De Santis, Milford, all of, Mass., assignors to Damon Corporation, Needham Heights, Mass.
Filed Aug. 15, 1968, Ser. No. 752,976
Int. Cl. B65b *43/60;* **B67c** *3/00*
U.S. Cl. 141—131 **18 Claims**



Continuous flow liquid distributing systems are disclosed in which a turntable has a concentric series of abutting funnels for controlling delivery to subjacent containers with liquid continuously delivered thereto from a pump controlled source. The operation of the turntable drive, of the pump, or of both is variable and where there are two or more series of funnels, means are provided to shift the delivery nozzle from a position over the last funnel of one series to the first funnel of another series.

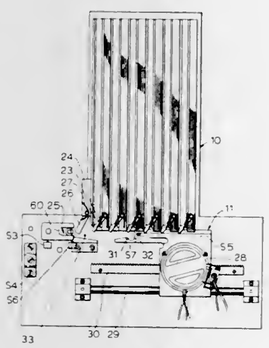
3,580,302
CONTAINER FILLING MACHINE
James H. Riesenberg, Amherst, N.Y., assignor to Consolidated Packaging Machinery Corporation, Buffalo, N.Y.
Filed May 27, 1968, Ser. No. 732,151
Int. Cl. B65b *57/06*
U.S. Cl. 141—141 **14 Claims**



A container filling machine having a container supporting tray and a filling head including a charging cylinder and a filling stem, the tray and head being mounted for movement

through a predetermined path. A piston is movable in the cylinder and a follower connected to the piston successively engages a first cam section extending along the path for moving the piston in a first direction to draw product from a source into the cylinder and a second cam section extending along the path for moving the piston in the opposite direction to discharge product from the cylinder. A spool-type valve is slidable between a first position placing the charging cylinder in communication with the source and a second position placing the cylinder in communication with the stem, the valve shifting arrangement being disabled prior to the discharge stroke in the absence of a container to be filled whereby the product is returned from the cylinder to the source. The cam sections are pivotally supported for movement in opposite directions to selectively vary the rise of the first cam section and thereby vary the piston stroke and consequently the volume of product dispensed. A spring-loaded check valve in the filling stem opens under discharging pressure applied by the piston, closing when the pressure is released, and a surface tension increasing element at the filling stem outlet avoids dripping. A return cam is positioned adjacent the exit end of the second cam section and is operable to engage the piston follower against the first cam section just prior to the conclusion of the discharge stroke, whereby the piston stroke is determined by the first cam section as a reference and the follower is eliminated as a variable.

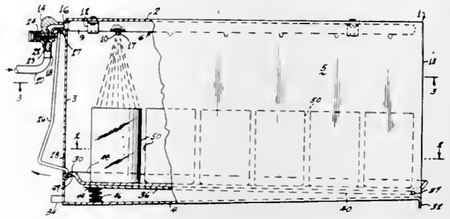
3,580,303
INFLATABLE TOY DISPENSER
Robert A. Roberge, 438 Pearl St., Brockton, Mass.
Filed Apr. 16, 1969, Ser. No. 816,627
Int. Cl. B65b *43/42*
U.S. Cl. 141—173 **5 Claims**



A coin operated balloon dispenser system having supply racks of uninflated ballons assembled as units on inflating needle-studs. Automatic electrical-mechanical system takes units from racks to inflation station where an inflator tube is brought into inflating connection from a helium supply, and inflated balloons are thereafter disengaged; subcombination of needle stud uninflated balloon assembly; method of needle stud-uninflated balloon assembly; and method of automatic inflation and dispensing of balloons.

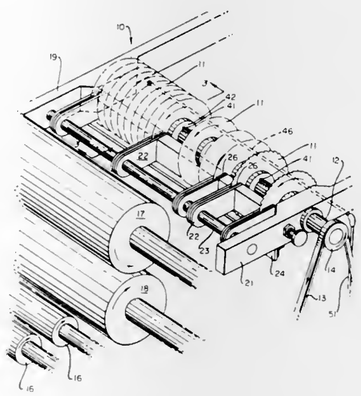
3,580,304
GLASS FILLER
Robert W. Chermack, 14424 Spring Lake Road, Hopkins, Minn.
Filed July 11, 1968, Ser. No. 744,033
Int. Cl. B65b *3/28, 3/36*
U.S. Cl. 141—244 **5 Claims**

Apparatus for simultaneously filling a plurality of receptacles, especially water glasses, having a distribution manifold with a plurality of downwardly directed discharge spouts and a flow control valve connected to the manifold, the operation of the valve being controlled by a lever positioned to be actuated in response to the movement of a glass tray into position beneath the aforesaid discharge spouts. The flow control valve may be a flush valve which passes a predetermined volume of water when its operating lever is tripped, or it may be an ordinary on-off valve which must be actuated to its open and closed positions. In the latter case, a spring-supported, weight-responsive platform supports the glass tray,



and when the glasses are filled, their weight will depress the spring so as to move the glass tray out of engagement with the valve operating lever, thereby permitting the lever to return to its normal, closed position.

3,580,305
SAWING MACHINE
Herbert Leslie Wright, P. O. Box 179, Philo, Calif.
Filed Mar. 3, 1969, Ser. No. 803,580
Int. Cl. B27b *5/34*
U.S. Cl. 143—37 **13 Claims**

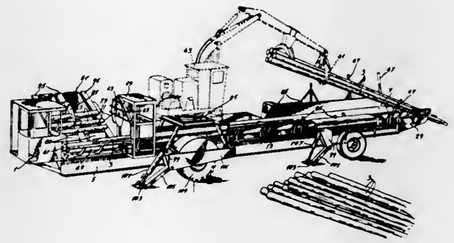


A sawing machine with a number of thin blades carried on an arbor includes edge margins guided by fluid bearings defined between guide surfaces disposed on each side of each blade. The spacing between guide surfaces is varied in precise parallelism while precise coplanar blade alignment is derived from consolidating all guides and blades together by forces applied along an axis defined normal to the blades and radially within their guided margins.

3,580,306
MOBILE TREE SLASHER
Jean Paul Tanguay, St. Prime, Quebec, Canada, assignor to Placements Jean Paul Tanguay Ltee, St. Prime, Quebec, Canada
Continuation-in-part of application Ser. No. 698,764, Jan. 18, 1968, now Patent No. 3,500,882. This application Aug. 22, 1968, Ser. No. 754,606
Int. Cl. B27b *11/12, 31/00*
U.S. Cl. 143—46F **3 Claims**

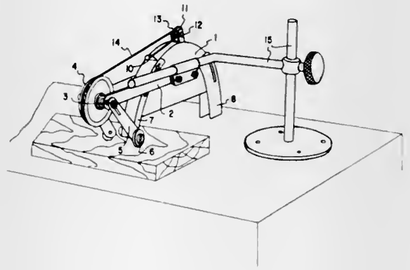
An apparatus for cutting trees stems into logs comprising a horizontal conveyor transporting the stems, a first rotary saw for cutting the stems into a first set of logs having twice their final length, an upwardly sloping conveyor for lifting the said first set of logs and a second rotary saw for cutting the first logs in half while the logs are raised. A table for discharging

logs from the horizontal conveyor to the upwardly sloping conveyor comprises a sweeping blade extending longitudinally of the transfer table and a hydraulic jack is used for moving the blade laterally across the table to move the logs thereon on the upwardly sloping conveyor. An apron is



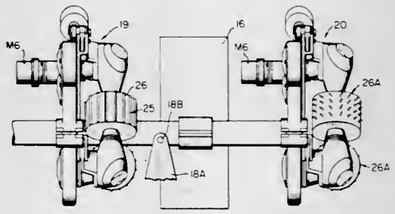
pivotally connected along one edge thereof to the discharge end of the transfer table and is downwardly inclined towards the sloping conveyor, springs biasing the apron upwardly and chains limiting the upward movement of the apron under the bias of the springs.

3,580,307
PROTECTION DEVICE FOR A CIRCULAR CUTTING SAW
Nicolae Minetos, Bucharest, Romania, assignor to Institutul De Cercetari Stiintifice Pentru Protectia Muncii, Bucharest, Romania
Filed Dec. 12, 1968, Ser. No. 783,195
Claims priority, application Romania, Dec. 12, 1967, 55,314
Int. Cl. B27g *19/02*
U.S. Cl. 143—159 **10 Claims**



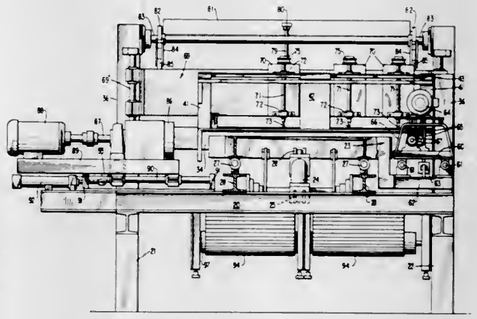
Safety device for use with a circular cutting saw in which a support means is provided forwardly of the saw with respect to the direction in which a workpiece is fed thereto. A pulley means is rotatably mounted on the support means forwardly of the saw and feeler is rotatable connected to the pulley means and extends forwardly of the saw into the path of a workpiece being fed thereto. A guard means connected to the support means covers the saw and includes a slideable guard member which is movable into and out of a safety position covering the forward edge of the saw. Cable means connects the pulley means to the slideable guard member. Thus, when the feeler means is contacted by a workpiece being fed to the saw and is caused to rotate toward the saw the pulley means is rotated causing the cable means to move the slideable guard member out of its safety position to an extent which is a function of the angle through which the feeler means is rotated by the workpiece being moved toward the saw.

3,580,308
TREE PROCESSING APPARATUS WITH FEED ROLLS
Douglas D. Hamilton, Montreal, Canada, assignor to Canadian International Paper Company, Montreal, Quebec; Quebec North Shore Paper Company, Montreal and St. Ann Abitibi Paper Ltd., Beaupre, Canada, fractional part interest to each
Filed May 18, 1967, Ser. No. 639,536
Claims priority, application Canada, May 20, 1966, 960,902
Int. Cl. B27c *1/12, 9/00;* **B27l** *1/00, 11/00*
U.S. Cl. 144—3 **15 Claims**



A device for propelling trees or the like along a selected path through one or more processing units, such device consisting of three or more driven rollers mounted on the free ends of respective ones of a plurality of pivotally mounted arms having the free ends movable toward and away from said path to respectively bring the rollers into and out of engagement with a tree located in the path. The rollers are disposed in a generally triangular arrangement and each roller has an outer peripheral surface for tractive engagement with the tree, such tractive surface consisting of an undulated surface provided by a series of cleats extending preferably in a direction perpendicular to the feed path. The cleats permit a tree to shift laterally with respect to the feed path. The cleats permit a tree to shift laterally with respect to the feed path while being fed through the processing units thereby facilitating maintaining the tree in alignment with the feed path.

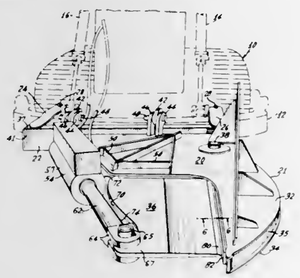
3,580,309
MACHINE FOR PROCESSING WHEELBARROW HANDLES
Eli Hochstetler, Star Route, Millersburg, Ohio
Filed Feb. 3, 1969, Ser. No. 795,818
Int. Cl. B27m *3/16;* **B27c** *5/06*
U.S. Cl. 144—11 **8 Claims**



An apparatus which during a continuous repetitive cycle delivers pieces of lumber, one at a time, to a supporting and clamping means. Each lumber piece in succession is shifted laterally during the supporting and clamping step to a work station where it is firmly held. During the shifting to the work station, each lumber piece is properly positioned longitudinally. While at the work station, plural right-angular

drilling means and a handle-shaping means are simultaneously activated to produce true openings transversely through each lumber piece while one end of the piece is being shaped into a handle. Some of the openings are formed at right angles to other openings. The drilling and shaping means are retracted and each handle is released onto a conveyor means for delivery to a coacting sander for the shaped handle portion.

3,580,310
TREE-SHEAR DEVICE WITH BLADE
Edward V. Frankenberg, and Norman N. Griffith, Jacksonville, Fla., assignors to Fleco Corporation, Jacksonville, Fla.
Division of Ser. No. 727,853, May 9, 1968
Filed Oct. 16, 1969, Ser. No. 866,951
Int. Cl. A01g *23/02*
U.S. Cl. 144—34 **3 Claims**

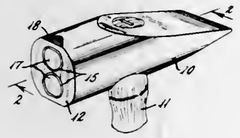


An improved tree-shear device having a pivotally mounted cutting blade powered by a cylinder and piston on which the rearward edge of the cutting blade is of a predetermined configuration to minimize the space between such rearward edge and the cylinder and piston disposed adjacent thereto during movement of the blade during its entire travel between its open and closed positions.

3,580,311
PROCESS FOR TREATING WOOD
Edward L. Fox, Jr., Fort Lauderdale, Fla., assignor to Canadian Cedar Inc.
Filed Oct. 16, 1968, Ser. No. 768,156
Int. Cl. B27k *5/00*
U.S. Cl. 144—309 **7 Claims**
0000

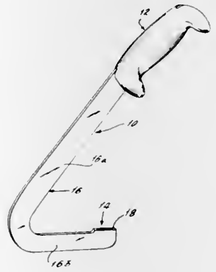
A wood product for use as interior or exterior paneling formed by sandblasting cedar lumber employing a composition of silica and anhydrous oxalic acid for removing fungus growth thus forming recesses or holes through the lumber while at the same time brightening and bleaching the lumber to provide paneling of uniform color which closely simulates pecky tidewater cypress.

3,580,312
MAGNETIC HAMMER
Robert Lay Hallock, 32 Vine Road, Larchmont, N.Y.
Filed Feb. 28, 1968, Ser. No. 709,076
Int. Cl. B25d *1/04*
U.S. Cl. 145—30 **2 Claims**



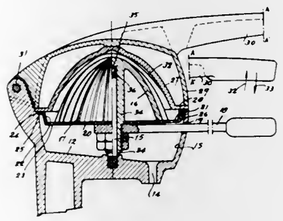
A hammer having a head of ferrous or other material with a striking face, at least one chamber at right angles to its striking face, with a permanent magnet in each chamber, and a hardened cap or end closure in each of said chambers in a manner to seal the magnet within the chamber and at the same time form a part of the striking face of the hammer.

3,580,313
SURGICAL INSTRUMENT
Charles Allen McKnight, 2914 Painted Valley Drive, Little Rock, Ark.
Filed Jan. 7, 1969, Ser. No. 789,474
Int. Cl. B25c *3/00*
U.S. Cl. 145—46 **13 Claims**



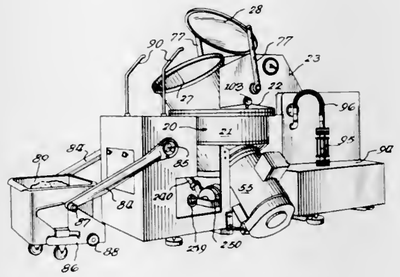
A surgical instrument including particularly a stapling-type instrument for attaching or anchoring fleshy parts of the body to adjacent bone structure including means to facilitate such attachments in areas of the body that are relatively inaccessible and difficult to operate in.

3,580,314
JUICE EXTRACTOR
Juan E. Besora, Avda. del Generalisimo, Franco No. 614—30 la, Barcelona, Spain
Filed Oct. 31, 1968, Ser. No. 772,180
Claims priority, application Spain, Nov. 3, 1967, 133,678
Int. Cl. A23n *1/02;* **A47j** *19/02*
U.S. Cl. 146—3 **6 Claims**



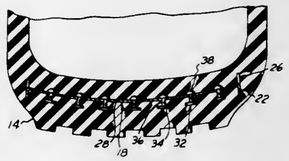
A juice extractor for citrus fruits and the like has a receptacle the upper side of which is open. A pulping member in form of an inverted bowl is mounted for rotation in the receptacle projecting upwardly beyond the open upper side thereof. The outer surface of the pulping member is provided with ribs. A handle is provided on the pulping member and extends outwardly through a slot in the circumferential wall of the receptacle so that the pulping member may be turned about the axis of the receptacle. A cap is pivoted to the receptacle and may be moved to a closed position in which it overlies the pulping member so as to compress a piece of fruit between the latter and the inside of the cap so that, when the pulping member is turned by means of the handle, the fruit will be pulped and juice extracted.

3,580,315
COMMINUTING MACHINE
Carl Schnell, Winterbach near Schorndorf-Wurttemberg, Germany, assignor to The Griffith Laboratories, Inc., Chicago, Ill.
Continuation-in-part of application Ser. No. 532,602, Mar. 8, 1966, now abandoned. This application Feb. 3, 1969, Ser. No. 795,912
Claims priority, applications Germany, Mar. 8, 1968, Mar. 11, 1965, June 1, 1965, Sept. 29, 1965, P 16 32 883.9, SCH 36,675, SCH 37,216, P 15 32 007.7
Int. Cl. B02c *18/06*
U.S. Cl. 146—79 **30 Claims**



Comminuting apparatus for comminuting or precomminuting materials, particularly food products, under continuous circulating conditions and, preferably, under deaerating conditions. This apparatus can be used effectively in conjunction or combination with additional comminuting apparatus which more finely comminutes materials previously comminuted or precomminuted in said first-mentioned comminuting apparatus.

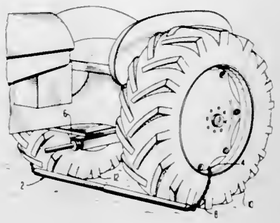
3,580,316
REINFORCED TIRE
George V. Mastrapas, 660 Virginia Park, Detroit, Mich.
Filed Jan. 8, 1969, Ser. No. 789,792
Int. Cl. B60c *19/12*
U.S. Cl. 152—200 **18 Claims**



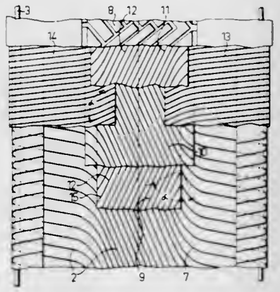
This invention relates to a reinforced tire. A thin steel sheet is wrapped radially interior to the tread. Rivets fixed to the sheet extend radially outward therefrom into the tread rubber. An array of indentations is provided on the sheet. Rubber adhering glue fixes the sheet to the tread rubber and more radially interior tire rubber. Brackets integral with the sheet and angularly displaced with respect thereto provide additional securing means between the sheet and the rubber of the tire.

3,580,317
DEVICE FOR EXTRACTING A MIRED MOTOR VEHICLE
Clifford McHargue, P. O. Box 28, Lily, Ky.
Filed Dec. 19, 1968, Ser. No. 785,196
Int. Cl. B62d *57/00*
U.S. Cl. 152—208 **11 Claims**

A device for removing a vehicle from a mired condition includes an elongated bar with an adjustable length. Connectors at the opposite ends of the bar are attached to spaced apart wheels or lugs of a vehicle. Powered movement of the wheels or lugs will move the bar against an undisturbed surface between the wheels or lugs to elevate the vehicle from its mired condition.



3,580,318
PNEUMATIC VEHICLE TIRE
Hans Menell, Ahlem, and Walter Scheithauer, Meyenfeld, Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany
Filed Dec. 2, 1968, Ser. No. 780,424
Claims priority, application Germany, Nov. 30, 1967, P 16 05 639.6
Int. Cl. B60c *9/02, 9/18*
U.S. Cl. 152—354 **8 Claims**

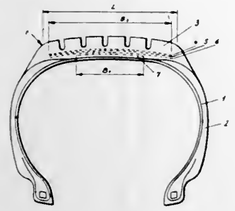


A pneumatic vehicle tire with at least one zenith layer, the parallel strength members of which are at least approximately parallel to adjacent strength member sections of the carcass and cross-additional parallel strength members in the tire sidewalls leading from the bead cores to the tire shoulders and also crossing with sections of carcass strength members adjacent to said tire shoulders. Those strength members of the zenith layers which extend substantially parallel to adjacent thread sections of the carcass form at least approximately right angles with the marginal areas of additional strength sections in the tire sidewalls.

3,580,319
PNEUMATIC TYRE
Werner Gorter, Baden, and Johann Hauser, Modling, Austria, assignors to SEMPERIT Osterreichisch-Amerikanische Gammiwerke Aktiengesellschaft, Vienna, Austria
Filed Apr. 11, 1969, Ser. No. 815,387
Claims priority, application Austria, Apr. 18, 1968, A3770/68
Int. Cl. B60c *9/04*
U.S. Cl. 152—361 **4 Claims**

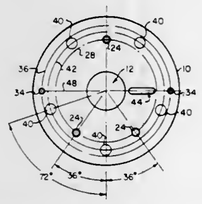
A pneumatic tyre having reinforcements inserts of a maximum width of less than 95 percent (preferably 85—90 percent) or more than 105 percent of the tread with and in

which the rubber sidewall on at least one side, and preferably both sides, is extended between the edge of the reinforcing



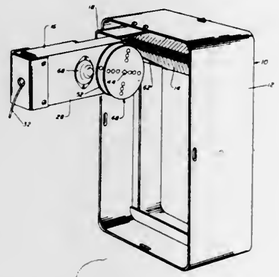
inserts and the carcass to an extent of at least 10 percent of the maximum width of the inserts.

3,580,320
ADAPTERS FOR USE IN TIRE CHANGING AND WHEEL BALANCING
Warren A. Roberts, 514 Clinton St., Redwood City, Calif.
Filed Sept. 30, 1968, Ser. No. 763,771
Int. Cl. B60c *25/06*
U.S. Cl. 157—1.24 **15 Claims**



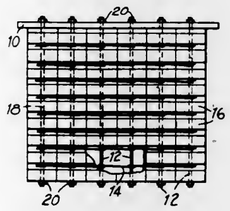
A circular plate is provided with pins on one side for engaging lug holes of a Volkswagon wheel and is provided with pins on the other side for engaging lug holes of an eight-lug Pontiac wheel. The plate is also provided with a central hole for receiving the locking mechanism of a tire changer or the balancing head of a bubble wheel balancer. In addition, the plate may be provided with holes for receiving the hub cap retaining clips of the Volkswagon wheel and the spring-stop mechanism of a tire changer to provide a dual wheel mounting adapter for use in tire changing. Alternatively, the plate may be evenly balanced in weight about its central hole to provide a dual wheel mounting adapter for use in wheel balancing.

3,580,321
SMOKE DAMPER
James R. Root, Independence, Mo., assignor to Ruskin Manufacturing Company, Grandview, Mo.
Filed Apr. 25, 1969, Ser. No. 819,203
Int. Cl. E05f *15/20;* **E06b** *9/204*
U.S. Cl. 160—1 **10 Claims**



A damper for automatically sealing building passages against the flow of fluids such as smoke. The damper comprises a plurality of blades held in a standby position by an energized motor and which automatically move to the closed position when the electrical energy to the motor is interrupted. Axial shifting of the motor responsive to electromagnetic forces effects the holding and release of the blade assembly.

3,580,322
FLEXIBLE REFRACTORY CURTAIN
David B. Herbert, Holden, and Ronald N. Barney, Westboro, Mass., assignors to Norton Company, Worcester, Mass.
Filed Apr. 14, 1969, Ser. No. 815,732
Int. Cl. E06b *9/24*
U.S. Cl. 160—231 **3 Claims**

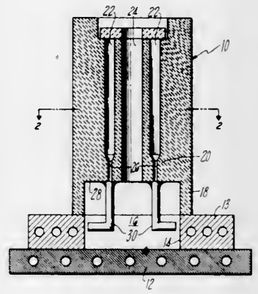


A flexible refractory curtain or covering is disclosed which is made up of an essentially horizontal supporting rod or tube to which is attached a network of flexible vertical and horizontal wires or cables to which are affixed segments made from a refractory material like silicon carbide, alumina or the like. The segments are so shaped and assembled on the flexible network that when the curtain is hanging in a vertical position the segments mate to form an effectively solid wall which functions as a barrier to the passage of heat and gases.

3,580,323
WINDOW SHADE
Robert C. Gossling, Cincinnati, Ohio, and George Armstrong, Sydney, N.S.W., Australia, assignors to Clopay Corporation, Cincinnati, Ohio, by said Gossling
Filed Dec. 4, 1969, Ser. No. 882,055
Int. Cl. A47g *5/02;* **A47h** *1/022*
U.S. Cl. 160—263 **6 Claims**

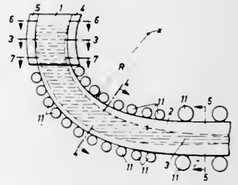
A window shade having a transversely symmetrical design. By a "transversely symmetrical design" is meant a design that extends across the shade either in the form of a scalloped or otherwise configurated lower edge, or in the form of an overall print so that the two edgewise areas of the design are the same. The disclosure is concerned primarily with a window shade roller of the type set forth that is adapted to be shortened quickly and easily by first cutting and removing equal widths of shade material from both ends of the roller, in order to preserve the symmetry of design, and second, telescoping the roller to bring the respective ends of the roller into proper relationship with the newly cut edges of the shade.

3,580,324
DOUBLE-ORIENTED SINGLE CRYSTAL CASTINGS
Stephen M. Copley, Madison; Anthony F. Giamei, Middletown; Merton F. Hornbecker, Woodbury, and Bernard H. Kear, Madison, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Mar. 13, 1969, Ser. No. 806,823
Int. Cl. B22d *25/06*
U.S. Cl. 164—60 **10 Claims**



An apparatus and method by which to produce single crystal parts in which the orientation of the dendrite growth in two planes at right angles to one another is described. In effect this produces an orientation in all three right angle planes of the cast article.

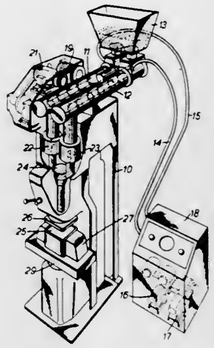
3,580,325
CONTINUOUS CASTING MACHINE FOR SLABS
Hans Schrewe, Duisburg-Ungelsheim, Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Germany
Continuation-in-part of application Ser. No. 550,713, May 17, 1966, now abandoned. This application Apr. 3, 1969, Ser. No. 813,171
Claims priority, application Germany, May 17, 1965 M65266
Int. Cl. B22d *11/00*
U.S. Cl. 164—82 **7 Claims**



A continuous casting machine for slabs includes a mold that has a mold passage of trapezoidal cross section with the base surface on the side of the center of curvature of the casting and the opposite surface being symmetrically arranged about the central plane of the mold passage.

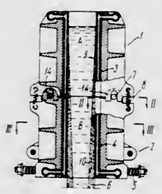
3,580,326
APPARATUS FOR MAKING FOUNDRY CORES AND MOULDS
Albert Edwards, Ailsworth, near Peterborough, England, assignor to British Cast Iron Research Association, Birmingham, England
Filed Mar. 26, 1969, Ser. No. 810,772
Claims priority, application Great Britain, Mar. 27, 1968, 14,654/68
Int. Cl. B22c *15/24*
U.S. Cl. 164—200 **5 Claims**

In the production of sand-based foundry cores and mould bodies by a substantially cold curing process employing a resin and a catalyst, charges of sand containing resin and sand containing catalyst are prepared in separate driven mixer-feeder units forming part of apparatus incorporating separate chambers into which the charges from the mixer-



feeder units are fed and from which they are blown into a common reaction chamber, the mixture then being blown from that chamber into a core-box or mould.

3,580,327
CONTINUOUS CASTING MOLD
Georgy Lukich Khimich; Vitaly Maximovich Niskovskikh, Sverdlovsk; Alexei Ivanovich Varaxin, Moscow; Evgeny Jukhimovich Gelfenbein; Leonid Alexandrovich Bykov; Anatoly Ivanovich Litvinov, and Stanislav Evgenievich Karlinsky, Sverdlovsk, U.S.S.R.
Filed July 15, 1968, Ser. No. 744,773
Int. Cl. B22d *11/06*
U.S. Cl. 164—280 **3 Claims**

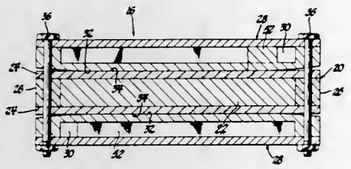


A continuous casting mold which has upper and lower portions made up of sidewalls, the sidewalls of the upper portion being fixed and defining a predetermined ingot path cross section, while the sidewalls of the lower portion are mutually movable. Fixing members, made up of rotary eccentric cams, connecting the vertically adjacent upper and lower sidewalls, and biasing means acting on the lower portion sidewalls to bias them radially inwardly to conform to the ingot shrinkage. Furthermore, second biasing means acting substantially in the direction of the ingot axis are provided on the sidewalls of both upper and lower portions to preclude a gap from occurring at the junction of the vertically adjacent upper and lower portions.

3,580,328
MOLD FOR IMPROVED CONTROL OF HEAT TRANSFER IN CASTING PLATE OR STRIP PRODUCTS
Robert E. Eppich, Southfield, and Fred J. Webbere, Orchard Lake, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed May 12, 1969, Ser. No. 823,706
Int. Cl. B22d *11/00*
U.S. Cl. 164—283 **5 Claims**

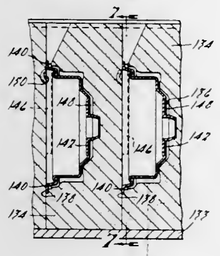
An open-ended mold is disclosed for continuously casting metal plate or strip, the mold having a graphite casting cavity

liner formed of two parallel plates separated at two of their opposing edges with spacer members so as to define an open ended cavity of substantially rectangular cross section, and two cooled metal jackets each tightly clamped against a liner plate. The two principal directions of heat transfer from the mold cavity defined by the liner are through the respective oppositely disposed graphite plates into the adjacent cooled jackets. Improved control over the rate of heat transfer from



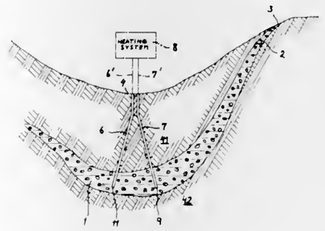
the mold cavity is obtained by providing a slight convex curvature or crown of suitable height on either the internal surfaces of each cooled jacket or the adjacent external surfaces of the liner plates so that when a crowned surface is tightly clamped against an adjacent flat surface positive control is maintained over the area of contact between the surfaces during casting despite the inherent tendency of the graphite liners to bow to the mold cavity when in contact with hot metal due to thermal expansion.

3,580,329
PLURAL MOLD CASTING APPARATUS
Russell W. Taccone, Erie, Pa., assignor to Kelsey-Hayes Company
Original application Sept. 18, 1967, Ser. No. 674,044, now Patent No. 3,517,728. Divided and this application Sept. 4, 1969, Ser. No. 871,043
Int. Cl. B22c *9/22*
U.S. Cl. 164—366 **2 Claims**



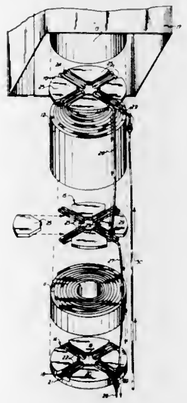
An apparatus and method for making castings which consist of successively forming a drag of a compacted green sand mixture having a cavity therein of a preselected pattern and disposed in an open ended flask, successively transferring the flasks by a transfer device into alignment with the inlet end of a casting tube adapted to guidably support a plurality of the molds disposed in face-to-face abutting relationship and pressing the mold from the flash in a manner to effect a trimming of the periphery of the mold to correspond with and to provide a sliding sealing fit with the inner surface of the casting tube, pouring molten metal into the cavities of the molds while disposed in stacked face-to-face abutting relationship within the casting tube and thereafter successively ejecting and transferring the filled molds to an elongated cooling tube provided with cooling means for accelerating the removal of heat from the molds. In some aspects of the apparatus and method comprising the present invention, a subatmospheric pressure is applied to the periphery of the molds while in the casting tube for removing gaseous products formed during the casting operation. An improved mold is also described which consists of a mass of compacted green sand having a core of a thin-walled shell of bonded sand disposed in overlying relationship on one face thereof providing porosity and precision in castings heretofore unobtainable.

3,580,330
GEOTHERMAL SYSTEM
Pierre Marcel Maugis, Suresnes, France, assignor to Societe Technique, De Geothermie, Paris, France
Filed Jan. 2, 1969, Ser. No. 811,266
Claims priority, application France, Jan. 3, 1968, Nov. 13, 1968, 134,778;175,285;1,734,267
Int. Cl. F28f *19/00*
U.S. Cl. 165—45 **6 Claims**



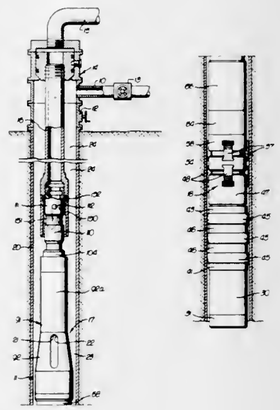
Hot geothermal water in liquid or vapor form rises, with the aid of a pump if necessary, in an insulated well and passes through a heat exchanger where its heat is utilized for urban heating. Subsequently, the spent water is reinjected through another well into the original geothermal body of water at a point sufficiently remote from the point at which it was extracted to prevent the cooled water from substantially lowering the temperature of the extracted water while ensuring a substantially steady hydrostatic pressure in the body of water.

3,580,331
APPARATUS FOR ANNEALING WITH ACCELERATED COOLING
William Wargo, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed May 23, 1969, Ser. No. 839,761
Int. Cl. F25b *29/00*
U.S. Cl. 165—48 **11 Claims**



Apparatus for cooling stacked coils of steel sheet from an annealing temperature at an accelerated rate. A hood is provided for sealing the coils from the oxidizing ambient atmosphere during the period when the coils are heated. Within the hood means, cooling separator structures are placed in contact with the planar coil surfaces. These separators include weight bearing members used to support the coils and provide space for closed fluid conduits. These conduits are interposed between, under and atop the coils in intimate contact with the planar surfaces of the coils. This arrangement provides for conductive heat transfer from the coils to coolant circulated in the fluid conduits without causing oxidation of the coils.

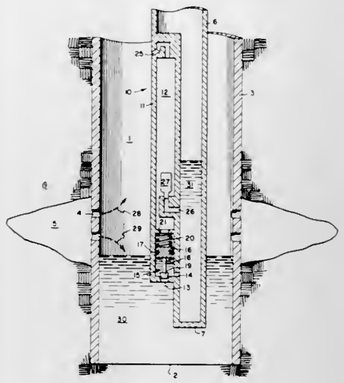
3,580,332
APPARATUS FOR CONTROLLING FLUID FLOW FROM GAS STORAGE WELLS AND RESERVOIRS
Michael R. Dean; Luis F. Castro, Houston, Tex., and John V. Salerni, Whittier, Calif., assignors to Baker Oil Tools, Inc., Commerce, Calif.
Filed Mar. 2, 1970, Ser. No. 15,403
Int. Cl. E21b *33/12*
U.S. Cl. 166—184 **23 Claims**



A retrievable packer with a large passage area and control valve connected thereto are run and set in a cased well bore. A plug is set in the valve, after which a tubing is connected to the plug and fluid pressure applied thereto to open the valve so that gas from the well or reservoir can flow through the packer and opened valve into the tubing-casing annulus and into a gas delivery line at the top of the well bore. The valve is tapered to provide a greater annular area between it and the well casing to allow unrestricted flow of gas from the well at a very high rate. In the event of damage to the surface equipment, the well pressure automatically closes the control valve. The valve can be closed whenever desired and the tubing string removed, after which the plug and control valve and packer are removable from the well casing through use of wireline equipment, and without the necessity for "killing" the well.

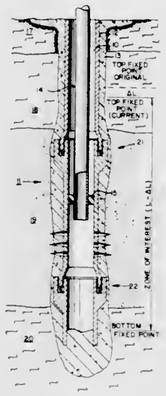
3,580,333
WELL LIQUID REMOVAL DEVICE
Bobby L. Douglas, Ennis, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.
Filed Sept. 11, 1969, Ser. No. 857,242
Int. Cl. E21b *33/00*
U.S. Cl. 166—224 **8 Claims**

A device for removing liquid from a well bore which utilizes two valve means. One valve admits liquid to the tubing



and the other valve admits gas to the tubing to lift liquid in the tubing to the earth's surface.

3,580,334
METHOD FOR PREVENTING DEFORMATION IN A WELL CASING
Leo P. Broussard, New Orleans, La.; Leon L. Dickson, Jr., and Wilhelmus J. G. Gardenier, Houston, Tex., assignors to Shell Oil Company, New York, N.Y.
Filed Jan. 22, 1970, Ser. No. 5,078
Int. Cl. E21b *17/08;, 49/02;* **G01n** *3/10*
U.S. Cl. 166—250 **7 Claims**



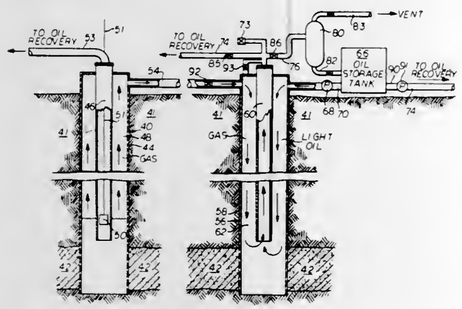
A method for preventing deformation of the casing of a well bore hole extending into a reservoir interval within a subterranean hydrocarbon-bearing earth formation wherein such deformation is caused by the compaction of the reservoir interval in which unconsolidated sand therein compacts when the fluid pressure of the interval is reduced. A core sample is extracted from the interval containing a substantially undisturbed portion of unconsolidated sand typical of that contained in the interval. The extent of vertical compressibility of the cored sample is measured relative to its orientation within the reservoir interval and its lateral confinement in the configuration it exhibits under an isostatic compressive force equaling that existing within the interval. The vertical extent of the sand contained within the interval and the extent of reservoir interval compression that would result from a vertical compression of the sand contained in the reservoir interval by an amount corresponding to the

measured compressibility of the core sample are determined. The portion of the well casing to be disposed against the interval is equipped with slip couplings adapted to provide an extent of slip having a selected degree of correspondence with the predetermined extent of reservoir interval compressibility.

3,580,335
OIL RECOVERY BY A COMBINATION OF SOLUTION GAS DRIVE AND WATERFLOODING
Joseph C. Allen; Valery N. Bednarski, Bellaire, and Russell W. Hall, Jr., Houston, Tex., assignors to Texaco Inc., New York, N.Y.
Filed Dec. 19, 1969, Ser. No. 886,785
Int. Cl. E21b *43/22*
U.S. Cl. 166—263 **4 Claims**

Improved oil recovery from an oil-bearing reservoir is obtained by a combination of solution gas drive and water flooding whereby the reservoir is produced by solution gas drive until the pressure of the reservoir is reduced below the bubble point pressure and a critical gas saturation is established, and thereafter the reservoir is produced by a water flood until the rate of oil production reaches a predetermined value or termination point, whereafter the cycle is repeated.

3,580,336
PRODUCTION OF OIL FROM A PUMPING WELL AND A FLOWING WELL
Robert F. Meldau, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Jan. 6, 1969, Ser. No. 789,163
Int. Cl. E21b *43/25*; **F04f** *1/20*
U.S. Cl. 166—267 **1 Claim**

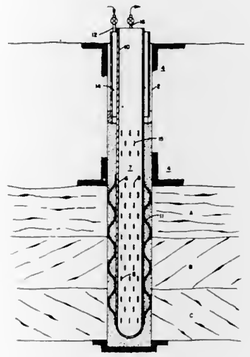


Production of oil from a pumping well and a flowing well wherein gas which is produced in the pumping well is conveyed to and utilized to facilitate production of oil from the flowing well. Flow from the flowing well may be initiated by pumping a light oil into the annulus. The method may be utilized with wells produced by fire flooding.

3,580,337
METHOD FOR STABILIZING THE MOBILITY OF POLYACRYLAMIDE SOLUTIONS FLOWING THROUGH POROUS MEDIA
William B. Gogarty, and Richard W. McAtee, Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio
Filed Apr. 14, 1969, Ser. No. 816,047
Int. Cl. E21b *43/22*
U.S. Cl. 166—273 **27 Claims**

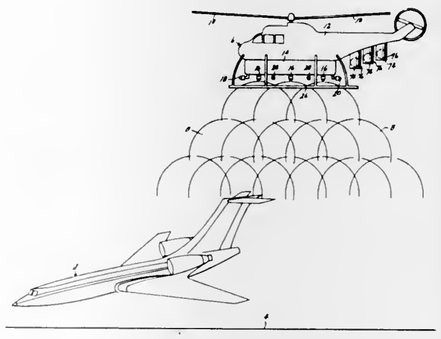
Oil saturations are decreased by flooding the oil-bearing subterranean formation with an aqueous solution of relatively low salt content containing a high molecular weight partially hydrolyzed polyacrylamide having incorporated therein from about 1 to about 50 ppm of a divalent cation of a water-soluble salt. The divalent cation stabilizes the polyacrylamide in the aqueous solution with regard to mechanical degradation and such enables a bank of the aqueous solution to maintain its mobility while traveling through the formation.

3,580,338
METHOD FOR INJECTING FLUIDS INTO UNDERGROUND FORMATIONS HAVING DIFFERING PERMEABILITIES
Derry D. Sparlin, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
Filed Aug. 6, 1969, Ser. No. 847,897
Int. Cl. E21b *43/04*
U.S. Cl. 166—276 **4 Claims**



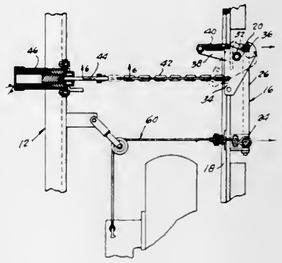
A method of simultaneously injecting fluids into adjacent sections of diverse permeability. A slotted sleeve or mesh cylinder is positioned in the wellbore opposite the formation and sand providing a low permeability pack is deposited in the annulus between the wellbore wall and the sleeve. Sand size is selected to provide a sand pack of permeability less than the lowest permeability of the formation. The sand pack may be consolidated with a resin. Fluid is injected down the interior of the sleeve, through apertures in the sleeve, through the low permeability, sand-filled annulus into the formation. Flow of fluids into the formation is more evenly distributed over the length of the wellbore section.

3,580,339
METHOD AND APPARATUS FOR COMBATTING AIRCRAFT FIRES
David Nance, P.O. Box 16291, Phoenix, Ariz.
Filed Jan. 30, 1969, Ser. No. 795,171
Int. Cl. A62c *3/06*
U.S. Cl. 169—2 **5 Claims**



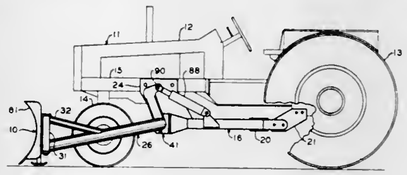
A method of combatting aircraft fires consisting of hovering an emergency aircraft, usually a helicopter, above an aircraft which has crash-landed or is in distress and is about to crashland, said helicopter thereby being positioned immediately above the aircraft either during or immediately after the crash landing, and being specially equipped to emit clouds of flame-smothering vapors to envelop the aircraft in trouble, whereby either to prevent fires or to immediately extinguish fires which may start, thereby to save large numbers of lives and incalculable amounts of property damage, and the apparatus for performing said method.

3,580,340
ELECTRONIC MARKER ACTUATOR
David N. Brown, 1426 Erie St., Ottawa, Ill.
Filed Oct. 25, 1968, Ser. No. 770,740
Int. Cl. A01b *69/02*
U.S. Cl. 172—126 **3 Claims**



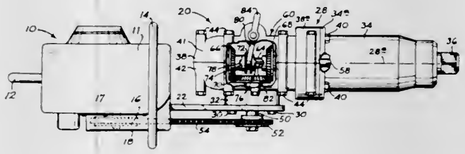
An electronic marker actuator for use with an agricultural device such as a planter that is provided with a pivotally connected marker which may be disposed in a substantially vertical position at one time, and released so as to be disposed in a horizontal position at another time, with pushbutton means disposed on the planter and catch means normally maintaining the marker in an upright position, and solenoid means operatively connected to the pushbutton means so as to actuate the catch means and release the marker from its upright position to a horizontal position.

3,580,341
DOZER FOR A FARM TRACTOR
Kyle E. Terrell, and Darryl C. Rester, Yazoo City, Miss., assignors to Amco International, Yazoo City, Miss.
Filed Aug. 18, 1967, Ser. No. 661,607
Int. Cl. E02f *3/76*
U.S. Cl. 172—805 **15 Claims**



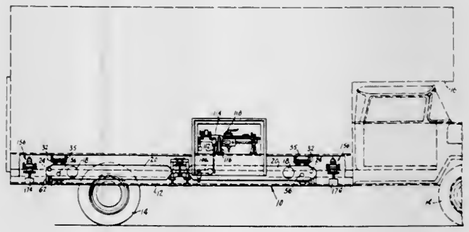
A dozer for a farm tractor which includes a blade pivotally mounted at one end to one leg of a substantially U-shaped blade frame, and an extension arm selectively interconnected pivotally between the other blade end and the other leg of the blade frame to pivot and angularly dispose the blade toward one side of the tractor. The extension arm is selectively located in a reserve position between the blade and blade frame when the arm is not in use and when the said other blade end is attached to the said other leg. The extension arm is pivotally attached at one of a pair of longitudinally spaced, front and rear connection points, and the said other blade end and said other leg are attached at the other connection point when the extension arm is selectively pivoted behind the blade in the reserve position. A bearing means, pivotally connecting the bight of the blade frame to the chassis frame, includes a journal carried by a support plate at each side of the chassis frame, the journals pivotally mounting the bight. Pivot means mounts one journal to its associated support plate about a pivot axis, while means movably mount the other journal to its support plate, whereby the blade can tilt about the pivot axis of said one journal.

3,580,342
ROTARY TOOL ATTACHMENT FOR CHAIN SAW MOTOR
William F. Matthews, Rte. 2, Box 1061, Coos Bay, Oreg.
Filed May 12, 1969, Ser. No. 823,912
Int. Cl. B27b *17/00*
U.S. Cl. 173—29 **8 Claims**



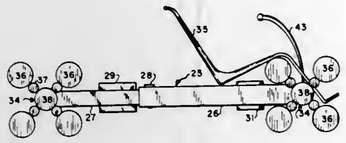
A rotary tool attachment for a chain saw motor drive unit, where such unit includes a motor housing and a motor-driven shaft protruding to one side of the housing and mounting a chain saw sprocket. The attachment comprises an elongated support adapted to be secured to the housing with such normal to the driven shaft of the drive unit. A tool-driving sprocket adjacent the end of the support remote from the driven shaft and in the plane of the chain saw sprocket is mounted on a power transmission input shaft which generally parallels the motor-driven shaft. The input shaft extends into a tool-housing assembly mounted on the remote end of the support and is connected through a power-transmitting means with right-angle drive train to a tool-driving head journaled on the tool housing assembly.

3,580,343
TRUCK WITH BUILT-IN WEIGHING MECHANISM AND LOAD HOLD-DOWN DEVICE
Dean M. Hogue, West Sacramento (10569 Dolcetto Drive, Rancho Cordova, Calif. 95670), and Carl M. Bender, 6007 Mack Road, Sacramento, Calif.
Filed Oct. 18, 1968, Ser. No. 768,787
Int. Cl. G01g *19/08, 23/02*
U.S. Cl. 177—136 **7 Claims**



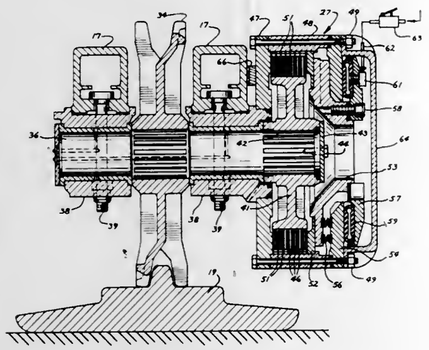
A truck chassis frame is provided with means for supporting a truck body thereabove, which means is utilized for operating a mechanism connected to a scale for weighing the body of the truck and the contents thereof. Before the truck operates in transit, the operator puts into operation means for fixing the truck body with respect to the chassis frame to prevent any movement of the truck body relative to the chassis frame during transit.

3,580,344
STAIR-NEGOTIATING WHEEL CHAIR OR AN IRREGULAR-TERRAIN-NEGOTIATING VEHICLE
Johnnie E. Floyd, 2609 E. Side Drive, Austin, Tex.
Filed Dec. 24, 1968, Ser. No. 786,674
Int. Cl. B62d *57/02*
U.S. Cl. 180—8-A **11 Claims**



A vehicle including a variable-length central frame upon which is pivotally and rotatably mounted multiple wheel assemblies. A central propelling means powering the wheel assemblies. A central propelling means powering the wheel assemblies through a central differential operably connected to individual planetary gear set differential wheel transmissions driving individual spider arm wheel assemblies which rotate the peripheral wheels and/or spider-arms as the need demands to climb or descend stairs, negotiate uneven terrain, and execute various maneuvers. The operator preselects through a central control a desired maneuver or function. The vehicle senses the most appropriate mechanical function and performs the maneuver by the optimum safe means.

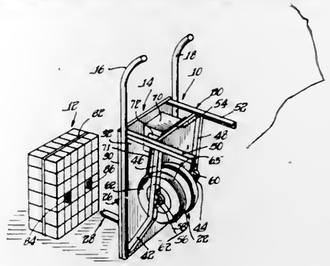
3,580,345
DISC BRAKE FOR TRACK-DRIVEN MACHINE
Archer W. Brown, Minneapolis; James L. Montgomery; Walter A. Beer, St. Paul, and Thomas J. Mero, Inver Grove Heights, Minn., assignors to American Hoist & Derrick Company, St. Paul, Minn.
Filed June 11, 1969, Ser. No. 832,203
Int. Cl. B62d *55/06*
U.S. Cl. 180—9.2 **11 Claims**



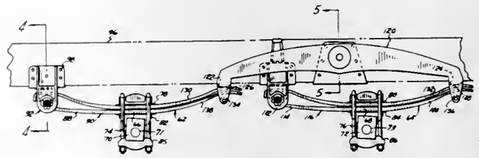
A crane equipped with a crawler travel assembly having a pair of endless tracks trained about drive tumblers and idler tumblers. Separate self-contained disc brake units are drivably connected to the axles attached to the idler tumblers. The brake units have torque arms anchoring the units to the track frame.

3,580,346
TRUCK
Terrence F. McLaren, 5104 W. 105th place, Oak Lawn, Ill.
Filed Apr. 30, 1969, Ser. No. 820,364
Int. Cl. B62d *51/04;* **B62b** *1/06*
U.S. Cl. 180—19 **3 Claims**

A truck which is particularly adapted for use in hauling a bundle of bricks at a construction site. The truck includes a flatbed to which is connected a pair of wheels. The flatbed has a plurality of pairs of spaced apertures, and a pair of cantilever arms is mounted in a selected pair of spaced apertures. The arms may be readily inserted into open spaces in a bundle of bricks to support the bricks on the flatbed for hauling the bundle of bricks.

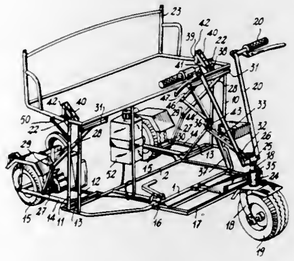


3,580,347
TAPERED SPRING LEAF SUSPENSION FOR DRIVER TANDEM AXLE ASSEMBLY
Donald J. McGee, Troy, Mich., assignor to Dura Corporation
Filed Dec. 13, 1967, Ser. No. 690,164
Int. Cl. B60g *5/00, 19/02*
U.S. Cl. 180—22 **13 Claims**



This specification discloses a suspension for a motor vehicle or trailer. The suspension comprises multiple tapered leaf springs fixed near their centers to an axle. At tareweight, the leaves are separated from each other near their ends. At full load, the leaves are compressed together near their ends. This provides a changing spring rate corresponding to variance of load. The arm of one leaf is rigid to horizontal compression, resisting acceleration and braking loads.

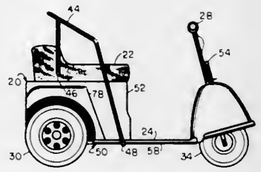
3,580,348
WHEEL COLLAPSIBLE FRAME
Rosario Di Blasi, Via G. Tell 2, Francofonte, Siracusa, Italy
Filed Apr. 7, 1969, Ser. No. 813,866
Claims priority, application Italy, Apr. 18, 1968, 15420A68
Int. Cl. B62k *15/00*
U.S. Cl. 180—25 **5 Claims**



Collapsible frame for wheeled vehicles, comprising a main structure to which rear forks are pivoted and carry wheels, a front footboard carrying a steering wheel, and a seat.

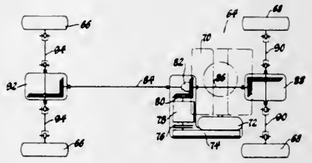
Said forks, footboard and seat are clampable to an open position where the frame is at running conditions and are operable to assume a closed position where the forks and footboard enter the main structure on which the seat can be overturned, in this case the frame occupying a rather reduced volume or space.

3,580,349
PORTABLE MOTORIZED CART
Edward N. Brennan, 9132 Edgewater Drive S. W., Tacoma, Wash., and Brian L. Brennan, 11616 Gorham, Los Angeles, Calif.
Filed Apr. 17, 1969, Ser. No. 816,892
Int. Cl. B62k *15/00*
U.S. Cl. 180—27 **4 Claims**



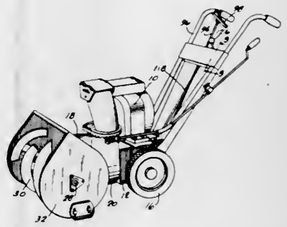
A portable motorized cart useful for transporting a person and his golf culbs over a golf course, a person over a sand dune or beach, and/or a person around a industrial area, etc. The cart is conveniently adjusted to a smaller overall size for its over road transportation, for example, in the trunk space of an automobile. Compaction of the cart for such storage and travel involves tilting of a foot rest or floor, telescoping of frame menbers, tilting of steering and control means, and, as necessary, removal of a seat and a golf club rack.

3,580,350
VEHICLE POWER UNIT AND DRIVE TRAIN
Zora Arkus-Duntov, Grosse Pointe Shores, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Jan. 23, 1969, Ser. No. 793,311
Int. Cl. B60k *5/04, 17/34*
U.S. Cl. 180—44 **7 Claims**



Arrangements for a vehicle power unit and drive train including a transversely mounted engine having a transmission mounted along one side thereof and a differential mounted along the other side. Power transfer means connect one end of the engine and transmission and may include a fluid coupling or torque converter, drive chain and mechanical clutch. A drive shaft passing under the engine crankshaft and preferably through the oil pan member drivably connects the transmission and differential. Alternative four-wheel drive arrangements provide a second drive shaft connected to a second differential with suitable differential or slip permitting drive means between the transmission and the two drive shafts.

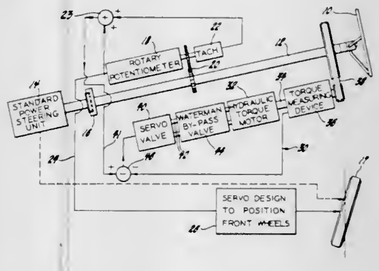
3,580,351
SELF-PROPELLED GARDEN TRACTOR VEHICLE
Ignatius J. Mollen, Brillion, Wis., assignor to Ariens Company, Brillion, Wis.
Filed Jan. 7, 1969, Ser. No. 789,555
Int. Cl. B60k *17/28, 25/00*
U.S. Cl. 180—53D **7 Claims**



Separate power-delivery trains actuate a power take off from the crankshaft and a variable ratio drive from the half-speed cam shaft to the wheels.

The drive to the wheels is a friction drive normally disengaged and controlled by a "dead man's grip." When disengaged, the driven disc is freely movable between any of its various positions transversely of the driving disc, thereby providing for plural speeds forward and/or reverse, and for neutral. Means prevents axial movement of the driving disc into contact with the driven disc in the neutral position of the latter.

3,580,352
STEERING TORQUE SERVO
Erling Hestad, Pontiac; Thomas E. Ritter, Utica, and Alton G. De Claire, Jr., Grosse Pointe Woods, Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Jan. 21, 1969, Ser. No. 792,466
Int. Cl. B62d *5/00*
U.S. Cl. 180—79.2 **3 Claims**

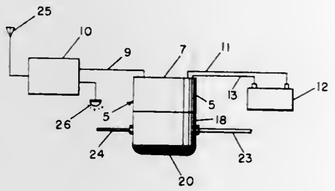


A vehicle-steering system in which the steering column may be mechanically disengaged from the steering linkage after which steering control is accomplished by generation of electrical signals representing desired dirigible wheel position. Steering "feel" is provided by a controlled torque motor connected to the steering column through a torsion bar torque sensor.

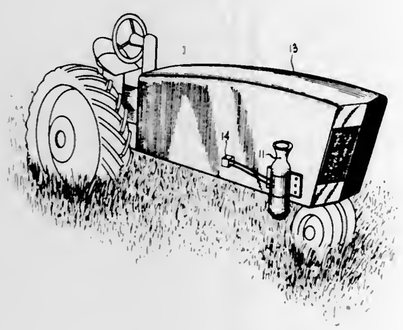
3,580,353
REMOTE CONTROL FOR FUEL LINE SHUT-OFF
Kermith R. Thompson, 7722 Dexter Blvd., Detroit, Mich.
Filed Apr. 12, 1968, Ser. No. 720,900
Int. Cl. B60k *31/00*
U.S. Cl. 180—98 **4 Claims**

This invention consists of a mechanism adapted to be connected into the fuel line of an internal combustion engine of

a vehicle between the fuel tank and the fuel pump, the aforesaid mechanism consisting of a two-piece vertically disposed metal receptacle that has its two sections screwed together on assembly. The uppermost one of the two piece receptacle contains an electric solenoid that is connected to an electric battery and to a signal receiver that receives its impulses from a transmitter located in another vehicle. The solenoid has a spring-loaded plunger that has its lower end extending down through a seal in the bottom of the uppermost one of the two-piece receptacle and on into openings in the wall of a horizontally disposed Y-shaped tube that is located in the lowermost one of the two-piece receptacle. The side of the lower portion of the plunger has an opening therein through which fuel will flow when this invention is inactive; the lower end of the plunger is adapted to enter an opening in the wall of the angularly disposed portion of the Y-shaped tube. This invention also has a blinking light connected to the aforesaid signal receiver in such a location as to be seen outside the vehicle containing this invention.



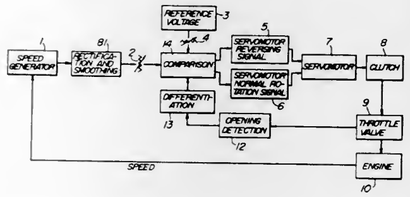
3,580,354
VEHICLE TILT COMPENSATOR
Harlan Douglas Hewitt, 1210 Astor St., Chicago, Ill.
Continuation-in-part of application Ser. No. 665,056, Sept. 1, 1967, now abandoned. This application Jan. 21, 1969, Ser. No. 814,216
Int. Cl. B60r *21/00*
U.S. Cl. 180—104 **6 Claims**



The following abstract is provided in accordance with Rule 72(*b*) and only for the purpose set forth therein.

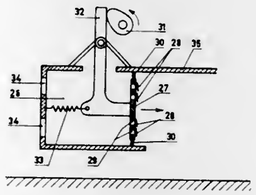
In the present invention, apparatus is provided for use in combination with a vehicle to prevent the vehicle from overturning or to delay the overturning action long enough to allow the driver to leave the vehicle safely. The apparatus includes thrust producing means activated when the vehicle is inclined beyond the critical balance angle of the vehicle, or when the vehicle reaches some predetermined position in relation to the critical balance angle. The thrust produced is used to return the vehicle toward its normal upright position.

3,580,355
AUTOMATIC SPEED CONTROL APPARATUS FOR AUTOMOTIVE VEHICLES
Yasushi Kitano, Osaka, and Kozo Fujita, Kyoto, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Jan. 3, 1968, Ser. No. 695,419
Claims priority, application Japan, Jan. 13, 1967, Jan. 13, 1967, Jan. 16, 1967, Feb. 21, 1967, Aug. 15, 1967, Nov. 16, 1967, Nov. 16, 1967, 42/2869;42/2870;42/3551; 42/11663; 42/52814; 42/74123; 42/74124
Int. Cl. B60k *31/00*
U.S. Cl. 180—105 **9 Claims**



An apparatus for the steady drive of an automotive vehicle at a predetermined speed setting, having a comparison means for comparing a signal representative of the vehicle running speed with a reference signal representative of the predetermined speed setting and a control means for driving a drive motor output regulator in a speed correcting direction depending on the difference between these two signals. In the apparatus, a third signal is introduced to shift the value of the difference signal and this shifted signal is used to attain the desired stabilization of the running condition of the vehicle.

3,580,356
PRESSURE WAVE SUSTAINED VEHICLE
Pieter VanStavern, Pijnacker, Netherlands, assignor to Nederlandse Organisatie voor Toegepast-Natuurweten-schappelijk Onderzoek ten behoeve van Nijverheid, Handle en Verkeer, The Hague, Netherlands
Filed May 27, 1968, Ser. No. 733,224
Claims priority, application Netherlands, May 29, 1967, 6707422
Int. Cl. B60v *1/00*
U.S. Cl. 180—116 **3 Claims**

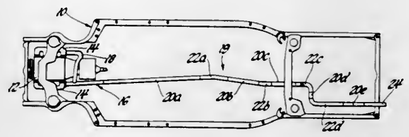


A method and devices are described for sustaining a vehicle by means of pressure wave pulses generated at the bottom side of the vehicle in the medium below the bottom.

The vehicle is hovering on a continuous sequence of spaced pressure waves which are moving substantially parallel to the bottom of the vehicle and it may be propelled by any appropriate means.

3,580,357
WAVE INTERFERENCE SILENCING SYSTEM
Donald R. Whitney, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed May 22, 1970, Ser. No. 39,705
Int. Cl. F01n *1/06, 1/12*
U.S. Cl. 181—44 **4 Claims**

A wave interference silencing system for predictably attenuating sound waves in the frequency noise spectrum of the exhaust gases from an internal combustion engine wherein a plurality of standardized serially connected attenuating sections includes a pair of discrete flow paths of differing acoustical lengths that are energy and flow compensated to establish actual sound propagational velocities so that the pressure waves of the individual paths are in phase opposition at the exit end of the transited attenuating section so as to destructively interfere within a low-impedance coupling volume adjacent thereto. The coupling volume serves to equalize the vibrational energy between the separate flow paths and effect a flow stabilization at the entrance end of a succeeding attenuating section.



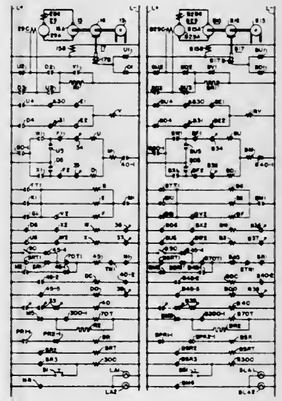
3,580,358
SAFETY ESCAPE BAG
Masatada Yamamoto, No. 2 Koujimachi Building 4-2, Koujimachi, Chiyoda-ku, Tokyo, Japan
Filed Aug. 8, 1969, Ser. No. 848,523
Int. Cl. A62b *1/20*
U.S. Cl. 182—48 **1 Claim**

A safety escape chute having a series of pliant tubular columns connected by resilient portions made of spiral mesh so that when a first escaper is in the chute his weight so deforms the spiral mesh resilient portions downwardly that a second escaper cannot pass therethrough and thus cannot collide with the first escaper at the bottom of the chute.

3,580,359
LADDER FOR FRUIT PICKER
Andreys O. Akermanis, 3401 N. Westmoreland Drive, Orlando, Fla.
Filed Nov. 10, 1969, Ser. No. 875,296
Int. Cl. E06c *7/08*
U.S. Cl. 182—49 **6 Claims**

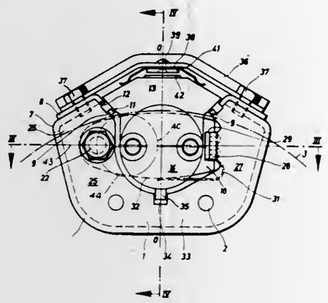
An improved ladder for use by a fruit picker, involving the use of a removable, lightweight receiving basket utilized in conjunction with an elongate tubular member, and arranged to be interfitted therewith so that fruit placed in the basket can be guided into the tubular member and thence carried by this member to a receiving location near the bottom of the ladder. My novel basket is very convenient for a fruit picker to use, and can be easily moved to any one of several locations on the ladder, depending on the height at which the picker may be working.

3,580,360
ELEVATOR SYSTEMS
Phillip C. Keiper, Shrewsbury, N.J.
Continuation of application Ser. No. 406,706, Jan. 28, 1954, now abandoned. This application Dec. 19, 1967, Ser. No. 691,913
Int. Cl. B66b *13/02*
U.S. Cl. 187—29 **17 Claims**



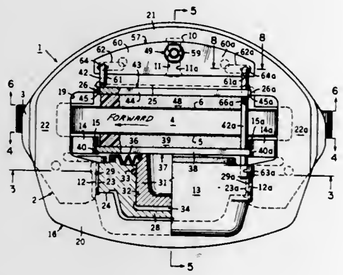
A bank of elevator cars has a dispatching floor. At a landing the doors of an elevator car are held open for a time such as 5 seconds. However, if a person passes through the doorway, the remainder of the time is replaced by a short delay such as one-half second before the doors are reclosed. The time may be reduced to a still lower value by operation of a switch. If a car is at the dispatching floor it is prevented from starting during a dispatching interval.

3,580,361
DISC BRAKE CONSTRUCTION
Giorgio Eggstein, Ospedaletti San Remo, Italy, and Heinz Ungerer, Stuttgart-Zuffenhausen, Germany, assignors to Ernst Heinkel Aktiengesellschaft, Stuttgart-Zuffenhausen, Germany
Filed June 17, 1969, Ser. No. 833,997
Claims priority, application Germany, June 21, 1968, A5974/68
Int. Cl. F16d *55/224*
U.S. Cl. 188—72.4 **11 Claims**



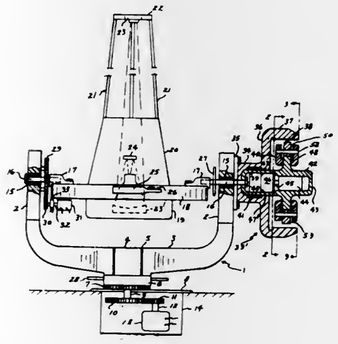
A disc brake comprises a rotor disc mounted for rotation about a predetermined axis. A mounting element straddles a section of the periphery of the disc and is adapted to be secured to a vehicle. A presser element also straddles the section and has portions located at the opposite sides of the disc. It is guided by the mounting element for movement axially of the disc. A friction pad is arranged between each of the portions of the presser element and the associated side of the rotor disc. Mounting means mounts each friction pad for free and independent sliding movement axially of the rotor disc between an inoperative position and an operative position in which latter it frictionally engages the rotor disc. Actuating means is associated with the presser element and one of the friction pads for urging the same in one axial direction to operative position while effecting concomitant movement of the presser element in opposite direction with resulting displacement of the other friction pad by the associated portion of the presser element to operative position.

3,580,362
DISC BRAKE
Edward J. Falk, St. Louis, Mo., assignor to Wagner Electric Corporation, Newark, N.J.
Filed Aug. 1, 1969, Ser. No. 846,721
Int. Cl. F16d *55/224*
U.S. Cl. 188—73.4 **29 Claims**



A disc brake having a rotatable disc with a support plate extending across substantially a chordal portion of said disc on which a closed loop member is movable, and actuating means for moving a friction element in one direction into frictional engagement with one side of said disc and for moving said closed loop member in the opposite direction to frictionally engage another friction element connected therewith with the other side of said disc. The support plate includes a pair of anchor means adjacent to said disc one side and embracing said first named friction element and a third anchor means adjacent to said disc other side and connected between said closed loop member and said support plate.

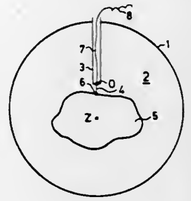
3,580,363
HYDRAULIC GIMBAL LOCK
Moshe L. Plawner, Wayne; Vincent R. Vento, Morris Plains, and Abraham Gordon, Teaneck, N.J., assignor to the United States of America as represented by the Secretary of the United States Air Force
Filed Nov. 19, 1969, Ser. No. 878,116
Int. Cl. F16d *51/00*
U.S. Cl. 188—74 **8 Claims**



An improved lock is disclosed, as applied to the elevation gimbal of a large telescope installation. Hydraulic pressure is employed firmly and simultaneously to force a number of contact members against a stationary surface of circular configuration and forming part of the fork gimbal or yoke pedestal. The hydraulic pressure is made effective by the use of a bellows system in which each bellows carries a contact head positioned a short distance from the stationary surface and the bellows are equally spaced from one another. A solenoid having a movable core and controlled from a position near the eyepiece of the telescope is employed to operate a miniature hydraulic pump which feeds oil under pressure simultaneously to each of the bellows. The latter elongate and press firmly against the stationary surface and at the same time, the motor which drives the gimbal to which the telescope is attached, can be declutched so that instant braking is effected. There is no overrun and the telescope remains strictly in line with the star being sighted when the control is operated.

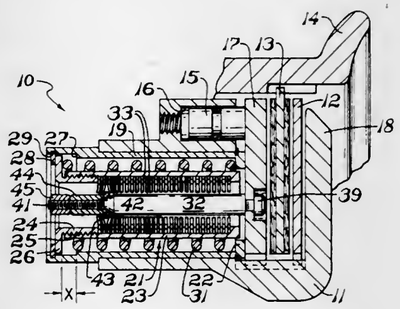
3,580,364
STABILIZATION PENDULUM SYSTEM
Cornelis M. Verhagen, Heemstede, Netherlands (c/o Datawell N.V., Zomerluststr. 4, Haarlem)
Filed Feb. 5, 1969, Ser. No. 796,830
Claims priority, application Netherlands, Feb. 14, 1968, Nov. 29, 1968, 68 02128; 68 17189
Int. Cl. F16d *57/00*
U.S. Cl. 188—87 **17 Claims**

Stabilization pendulum system comprising a vessel filled with a liquid, an object immersed in the liquid, the weight of the object differing very little from the weight of the displaced liquid, and the object containing electrical measuring equipment, the system also including a suspension means attached to the vessel. The suspension means includes a suspension thread one point along the length of which is fixed, the object attaching to and suspending from the thread. The thread includes a free suspending portion between a point of the vessel and a point of the object, and further includes one or more electrical connectors integral therewith which serve as electrical connections for the measuring equipment. The suspension means also includes a



guiding body, the portion of which is nearest the object defines a guiding surface that includes a bore extending into the guiding body, the free suspending portion of the thread running through the bore whose diameter gradually increases in a direction toward the object. The thread also extends beyond the point of the vessel in a direction away from the object.

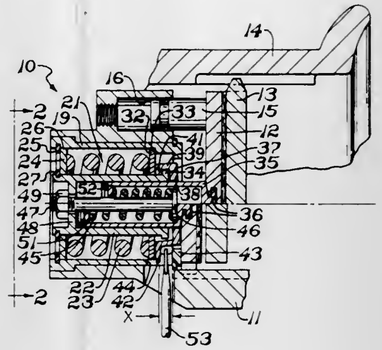
3,580,365
AUTOMATIC ADJUSTMENT MECHANISM PARTICULARLY FOR BRAKES
Ludwik S. Bialkowski, Troy, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.
Filed May 19, 1969, Ser. No. 825,717
Int. Cl. F16d *65/54, 55/18*
U.S. Cl. 188—196P **8 Claims**



A brake retractor assembly in which the automatic adjustment mechanism has a plurality of leaf springs in slidable engagement with the retractor rod and a spring engaging member on the rod is disposed so that sliding movement does not occur during retraction of the braking members and limited sliding movement does occur during actuation of the brake providing positive adjustment of the brake to compensate for wear and other changes.

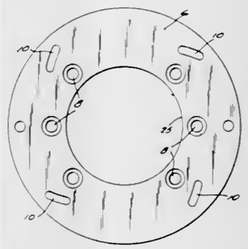
3,580,366
BRAKE RETRACTOR RESETTING MECHANISM
C. Lucas Plaat, and Donald F. Linn, Troy, Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.
Filed May 21, 1969, Ser. No. 826,418
Int. Cl. F16d *65/54, 55/18*
U.S. Cl. 188—196 **1 Claim**

A brake retractor assembly in which the automatic adjustment mechanism has a locking plate carried by a sleeve member surrounding the retractor rod and held in tilted locking position during brake retraction and in which the locking plate is automatically moved into unlocked position during brake actuation when the rod is moved beyond the normal brake release clearance distance. A return spring connection between the rod and sleeve member resets the rod automatically to its original position in the sleeve



member upon movement of the locking plate to the unlocked position when the brake lining needs replacement.

3,580,367
UNIVERSAL MOUNTING PLATE AND CONSTRUCTION METHOD
Richard H. McCarthy, Milwaukee, Wis., assignor to Stearns Electric Corporation, Milwaukee, Wis.
Filed Dec. 19, 1968, Ser. No. 785,320
Int. Cl. F16d *65/02*
U.S. Cl. 188—206 **2 Claims**

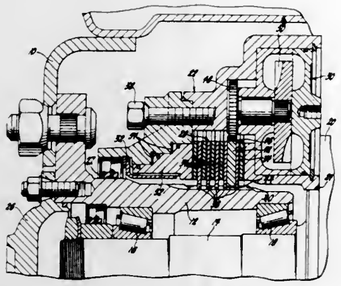


Exemplification consists of a caliper brake end plate which also serves to mount the brake from a motor shell or the like. To hold the plate securely on motors having mounting bolts which are on bolt circles of differing radii, the plate is correspondingly arcuate about predetermined centers offset from the plate axis according to a formula.

3,580,368
DISC BRAKE COOLING MEANS AND PUMP DRIVE MECHANISM
Burnette Heck, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed June 2, 1969, Ser. No. 829,330
Int. Cl. F16d *65/84*
U.S. Cl. 188—264 **4 Claims**

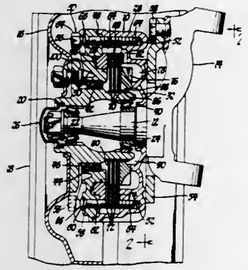
A liquid-cooled disc brake wherein the cooling liquid is pumped through the brake by a small high-speed rotary im-

peller pump driven by the rotating hub of the wheel to be braked. The pump drive uses the disc pack to provide a



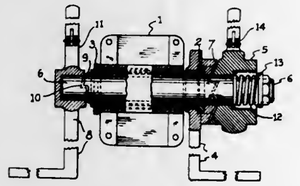
clutch drive when the brake is energized and a slower speed viscous shear drive when the brake is released.

3,580,369
LIQUID-COOLED DISC BRAKE ASSEMBLY
Burnette Heck, Bloomfield Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed June 27, 1969, Ser. No. 837,097
Int. Cl. F16d *65/84*
U.S. Cl. 188—264 **4 Claims**



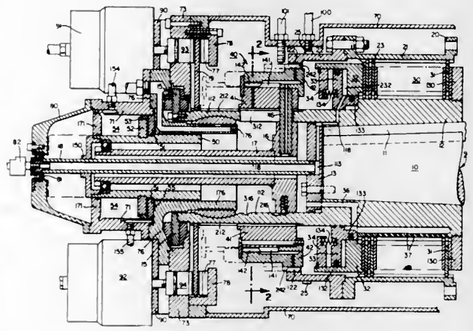
A brake having a sealed housing containing a disc pack for braking the wheel with which the brake assembly is associated. The brake has a wheel hub-driven pump which pumps cooling liquid radially inwardly through the disc pack and then to a heat exchanger arrangement including ballast tanks. The sealed assembly is fastened together with shear head bolts having a conical sealing head construction. The brake assembly is readily mountable on standard production wheel spindles by use of an adapter plate mounting bracket.

3,580,370
AUTOMATIC ACCELERATOR SAFETY DEVICE
James Elvin McCammon, 224 1/2 E. Broadway, West Memphis, Ark.
Filed Aug. 29, 1968, Ser. No. 756,740
Int. Cl. F16d *67/00*
U.S. Cl. 192—3 **2 Claims**



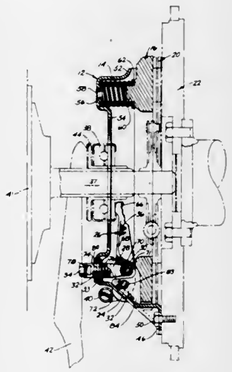
My invention is an Automatic Accelerator Safety Device, a means for braking and accelerating an automobile equipped with an automatic transmission, where the optional phases speed, and direction, are manually controlled, and the remaining functions are automatic. With the L-shaped braking pedal and the L-shaped accelerator pedal mounted on the inner side of the front dash panel, or the braking and accelerator treadle means, each the width of a shoe, mounted on the sloping floor boards, the braking means being activated by action of the left foot depressing the left or brake pedal or left treadle means, with the accelerator means being activated by like action of the right foot depressing the right accelerator pedal or right treadle means, disengaging the accelerator by action of a notched ratchet camlike face at the point where said brake pedal joins the connecting shaft, said shaft journaled in an inner sleeve, same journaled in an outer sleeve, same journaled in a bearing mounted on the motor side of the automobiles front dash panel, to the accelerator arm, engaging a like notched ratchet camlike edge of the end of a sleeve extending thru and journaled in same bearing and secured to the accelerator arm, same sleeve and arm rotating on connecting shaft, driving same accelerator arm out of mesh, disengaging notched ratchet camlike clutch face of the accelerator pedal rotating on outer sleeve said shaft, rendering same accelerator arm inactive, same remaining idle, held in place by a spring means as it is disengaged from the accelerator pedal means, until the braking means, the pedal or treadle is released by the left foot being removed, thus the accelerator arm connecting with the carburetor engages the accelerator pedal or treadle by action of a spring means, driving the notched ratchet camlike face clutch means into engagement, activating the accelerator pedal or treadle when the right foot is depressed or applied. This being the safety feature of my invention, as the automobile cannot be accelerated when the brake is depressed or applied.

3,580,371
SELF-SYNCHRONIZING CLUTCH
Harold O. Kron, Philadelphia; John K. Liu, Valley Forge, and Edward Behnke, King of Prussia, Pa., assignors to King of Prussia Research and Development Corporation, King of Prussia, Pa.
Filed Oct. 16, 1969, Ser. No. 866,916
Int. Cl. F16d *23/04, 23/10*
U.S. Cl. 192—18A **9 Claims**



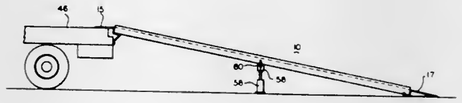
Clutch means are disclosed comprising a friction clutch in parallel with a positive-drive dental clutch assembly. The friction clutch is first engaged to bring the driven member up to the speed, or almost to the speed, of the driving member. The dental clutch is then engaged to provide a positive drive. The dental clutch assembly includes a sliding helical gear element for automatically aligning the teeth of the dental clutch prior to engagement. Brake means are provided for braking the rotational speed of the slidable clutch element.

3,580,372
CLUTCH WITH ADJUSTABLE CENTRIFUGAL PRESSURE ASSIST LEVERS
Paul J. Schiefer, Sherman Oaks, and James D. McFarland, Jr., Chatsworth, Calif., assignors to Schiefer Manufacturing Company, Monterey Park, Calif.
Filed May 26, 1969, Ser. No. 827,691
Int. Cl. F16d *43/06*
U.S. Cl. 192—105 **9 Claims**



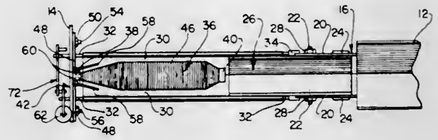
A centrifugal pressure assist type clutch utilizes the constant force of compression springs and a variable dynamic force to load a pressure plate against a driven disc. The clutch is adjustable to vary the dynamic loading of the pressure plate on the driven disc and therefor the engagement force of the clutch with a flywheel. The clutch has a plurality of radially disposed release fingers pivotally secured to a clutch cover in a common plane normal to the axis of rotation of the clutch. The fingers are also pivotally secured to the pressure plate. Each finger has a lever portion which extends radially inward from the finger's pivotal connection to the clutch cover for selective engagement by a clutch release bearing. Each finger also has a centrifugal weight to create a moment which is a function of the rotational speed of the finger that tends to pivot the finger about the pivotal connection to the clutch cover and force the pressure plate against the driven disc. The adjustment of the dynamic loading is effected through movement of the position of the fingers' pivot axes on the clutch cover relative to the finger pivot points on the pressure plate and therefore the moment of the fingers at a given rotational speed.

3,580,373
PORTABLE RAMP
Stanley A. Stickle, Anaheim, Calif., assignor to Clark Equipment Company
Filed Nov. 21, 1968, Ser. No. 777,564
Int. Cl. B65g *11/00*
U.S. Cl. 193—5 **2 Claims**



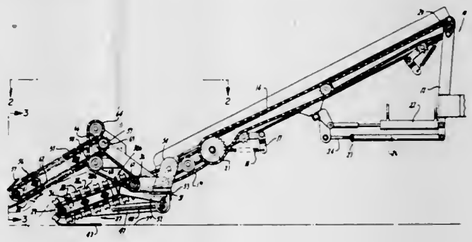
A portable ramp having a plurality of elongated floor members with devices for detachably securing the floor members together in side-by-side relation to form a complete floor portion. A transverse member is detachably secured to the floor member at one end thereof and to a vehicle and another detachable transverse member is detachably secured to the floor portion at the other end thereof.

3,580,374
BOBBIN ORIENTING
Charles W. Brouwer, East Greenwich, R.I., assignor to Leesona Corporation, Warwick, R.I.
Filed Jan. 8, 1969, Ser. No. 789,758
Int. Cl. B65g *11/20*
U.S. Cl. 193—43 **2 Claims**



A device for orienting bobbins having opposite ends of different sizes. A gauge is provided for receiving only the smaller end of the bobbin. As the bobbin is delivered to the device either the larger or the smaller end may be presented to the gauge. In the event that the smaller end is presented to the gauge the bobbin is supported solely on a trap door which opens so that the smaller end of the bobbin pivots about the gauge as the bobbin is discharged large end downward. If the larger end of the bobbin is presented to the gauge, the smaller end is above an abutment with an intermediate portion of the bobbin supported by the trap door so that when the trap door is opened the smaller end pivots about the abutment and again the bobbin is discharged larger end downward.

3,580,375
SOD-HANDLING MACHINE
John F. Nunes, Jr., 2037 Loquot Ave., Patterson, Calif.
Filed Mar. 3, 1969, Ser. No. 803,825
Int. Cl. A01b *45/04;* **B65g** *65/06*
U.S. Cl. 198—8 **5 Claims**

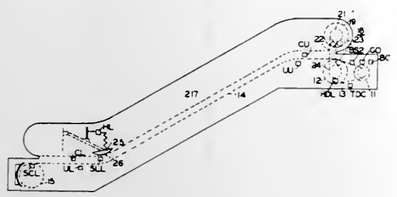


For picking up precut sod from the ground or other support surface, the lower one of a pair of cyclically driven carriers first nudges the transverse edge of the sod upwardly into engagement with a rearwardly moving reach of an upper cyclic carrier. The confronting reaches of the upper and lower carriers engage opposite surfaces of the slab of sod to feed the sod upwardly into the machine for handling.

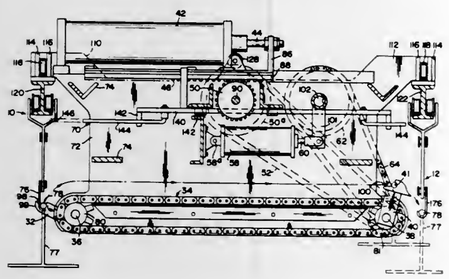
3,580,376
ESCALATOR SYSTEM HAVING FAULT INDICATOR
Richard C. Loshbough, Toledo, Ohio, assignor to Reliance Electric Company, Toledo, Ohio
Filed Jan. 2, 1969, Ser. No. 788,474
Int. Cl. B66b *9/12*
U.S. Cl. 198—16 **8 Claims**

An escalator system having a safety circuit to prevent operation under unsafe conditions and including a trouble indicator arranged to respond to any of a plurality of trouble-sensing switches in an escalator control circuit and structure. Two indicators are provided for each trouble condition, one which is actuated while trouble persists and the other is latched to retain an indication of trouble after the sensing

circuit has been reestablished whereby an indication of a currently existing trouble condition is augmented by an indication of a previously existing trouble condition. Advantageously, the indicator can be connected and disconnected from the escalator system and is mounted in a portable case.



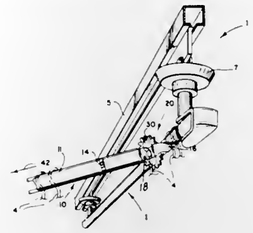
3,580,377
CONVEYOR ARTICLE TRANSFER APPARATUS
Arthur H. Kiehl, 708 Rancho Drive, San Luis Obispo, Calif.
Filed Jan. 15, 1969, Ser. No. 791,373
Int. Cl. B65g *47/00*
U.S. Cl. 198—20 **13 Claims**



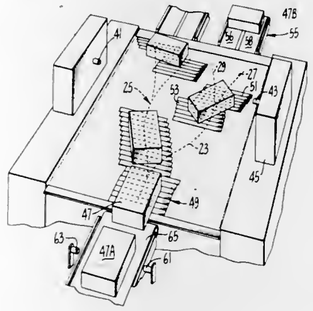
This apparatus is for automatic transfer of articles from one conveyor to an adjacent second conveyor and it includes frame means positioned between the conveyors and having endless band means journaled thereon for movement from adjacent one conveyor to a point adjacent the second conveyor. Pickup means are carried by the band means to engage an article on the one conveyor and move it to a point adjacent the second conveyor where article deposit means engage the article on the pickoff means and disengage it therefrom. Control means are provided to operate the article deposit means and place an article thereon onto a support on the second conveyor, and subsequently, by a similar apparatus, to return the article and normally its carrier means to its original position on the first conveyor.

3,580,378
AUTOMATIC HANGER DISCHARGE
Erik J. Pedersen, 1875 Conn. Ave. N.W. Suite 1205, Bethesda, Md.
Filed Nov. 14, 1968, Ser. No. 775,682
Int. Cl. B65g *47/61, 47/36, 47/46*
U.S. Cl. 198—25 **9 Claims**

Hangers such as conventional coat hangers are suspended from a rod carried by a first conveyor. An end of a second conveyor having a toothed rotary transfer element and a guide means is swung into position along the rod. The guide means aligns the hangers on the pipe so that they may be engaged by the teeth of the transfer. As the transfer rotates, it lifts the hangers one at a time from the rod and deposits the hangers on a continuously moving band which is exposed along an upper surface of the second conveyor. The band carries the hangers along the second conveyor and drives the rotary transfer element.



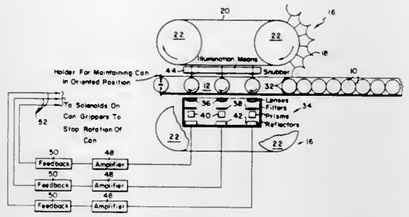
3,580,379
PACKAGE TURNING DEVICE
Joseph Shuster, Saratoga, and Richard L. Brown, Sunnyvale, Calif., assignors to Icore Industries
Filed May 12, 1969, Ser. No. 823,840
Int. Cl. B65g *47/24, 47/26*
U.S. Cl. 198—31AB **4 Claims**



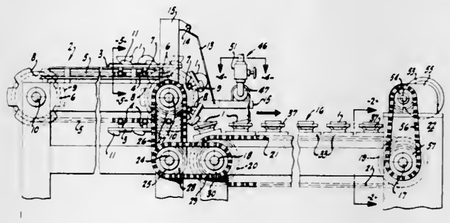
A package turning device wherein a package is supported on a series of carriers which are free to slide from side-to-side on rods carried by endless chains on each side of a conveyor. The turning action is provided by a switching mechanism whereby the front portion of the carton is conveyed in one direction by a series of carriers while the rear portion of the package is supported on carriers which are switched to a different direction, so that as the package travels it is turned about 90° to its previous orientation. In a preferred embodiment of the device, two lanes are provided so that a series of packages in single file are divided into two files with the packages turned at 90° to their former orientation.

3,580,380
METHOD OF AND APPARATUS FOR ORIENTING INDICIA BEARING CYLINDRICAL OBJECTS
Bryce W. Phillips, Henrico County, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed Sept. 11, 1968, Ser. No. 759,139
Int. Cl. B65g *47/24;* **G01n** *21/28*
U.S. Cl. 198—33 **15 Claims**

Indicia bearing cylindrical objects are oriented prior to being grouped and packaged so that the oriented objects provide their own advertising. In one embodiment, the objects are both rotated and translated as they traverse a plurality of inspection stations, each of which inspects less than a complete revolution of the object but the total of which inspects more than a complete revolution. Whenever any station produces a coincidence signal, rotation of the object is stopped to permit oriented grouping. In another embodiment, the objects do not rotate until after a coincidence signal is produced by comparison with a segment of the decorated object. Thereafter, a measured rotation is imparted to the object so that it is positioned in a desired orientation for grouping.

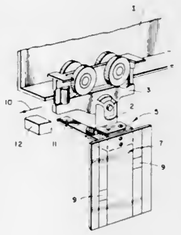


3,580,381
APPARATUS AND METHOD FOR LEVELLING DRUPE HALVES AND THE LIKE
George E. Kilner, Alameda, Calif., assignor to Filper Corporation, San Rama, Calif.
Filed May 15, 1969, Ser. No. 825,005
Int. Cl. B65g *47/24*
U.S. Cl. 198—33 **7 Claims**



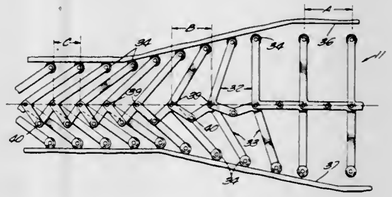
Apparatus and method for automatically orienting and conveying hemispherical objects each having a planar surface opposite to a hemispherical surface so said planar surfaces, when facing generally upwardly, but if slanted relative to horizontal, will automatically position themselves, while conveyed along a path of travel, so their planar surfaces are horizontal.

3,580,382
SIGNAL DISABLING DEVICE
Richard E. Nearman, Mount Airy, Md., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Nov. 14, 1968, Ser. No. 775,883
Int. Cl. B65g *43/00*
U.S. Cl. 198—38 **7 Claims**



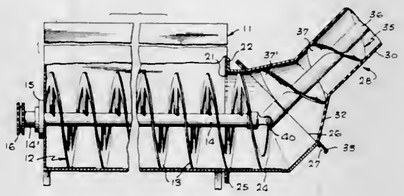
A signal disabling device for a carrier identification signaling plate used in a conveyor system is described herein. The disabling device of the present invention has a base, a signal indicia mounting means pivoted in the base and held against spring force in a first signal operative position by a latch on a lever. When the lever is tripped, the indicia mounting means is unlatched and is automatically moved into a second inoperative position.

3,580,383
VARIABLE PITCH CHAIN ASSEMBLY
Jurjen Van Der Wal, LaMirada, Calif. (1819 Port Stirling Place, Newport Beach, Calif. 92660)
Original application Jan. 24, 1968, Ser. No. 703,224. Divided and this application Sept. 29, 1969, Ser. No. 870,375
Int. Cl. B65b *9/12;* **B65g** *15/02, 21/12*
U.S. Cl. 198—16 **45 Claims**



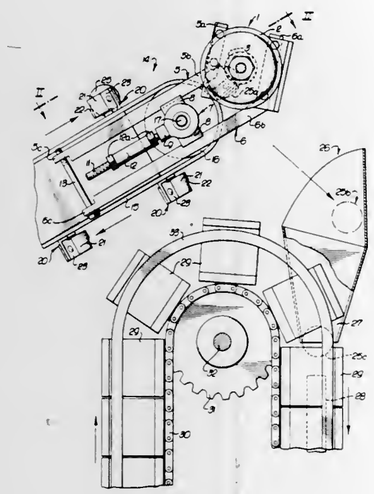
A variable pitch chain link assembly adapted to be operated in tension from a single driving source. Different portions of the chain assembly travel simultaneously at different speeds varying as widely as six to one using a driving power source operating at uniform speed. Basically a single chain assembly suffices to practice the fundamental principles of the invention. A simple link chain is provided equipped with rigid arms projecting from the opposite sides thereof and each effective in cooperation with cam means confined to the related side of the chain to flex the chain linkage either in a direction to shorten or to lengthen the chain pitch depending upon the contour of the cam means. The rigid arms are so arranged as not to pivot across the plane of advance thereby permitting free access to the chain in this plane for connection of other equipment in a wide range of useful operating environments for the invention chain assembly.

3,580,384
MATERIAL FEEDING APPARATUS
Robert J. Pingree, Torrance, Calif., assignor to Ameron, Inc., Monterey Park, Calif.
Filed Jan. 27, 1969, Ser. No. 794,194
Int. Cl. B65g *33/26*
U.S. Cl. 198—64 **6 Claims**



Screw conveyor means for elevating a relatively thick wet fluid substance, such as cement mortar, in which a first conveyor screw feeds toward a conduit of less diameter containing a second conveyor screw connected to the first by a universal joint located at a point ahead of a converging conduit section at the intake end of the conduit.

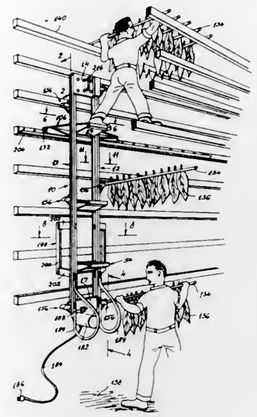
3,580,385
DOUGH FEEDING APPARATUS
Daniel T. Thompson, 10584 Bradbury Road, Los Angeles, Calif.
Filed Dec. 23, 1968, Ser. No. 785,932
Int. Cl. B65g *37/00*
U.S. Cl. 198—103 **9 Claims**



An apparatus for transporting a plurality of divided elements of a tacky dough substance to a predetermined location where the elements are shaped into toroids. An impelling mechanism consisting essentially of driven impeller wheels is associated with the apparatus. The wheels engage and impel the elements from their predetermined location of a conveying portion of the apparatus at a uniformly predetermined rate, to a toroid-forming machine. The use of the impelling mechanism avoids pileup of one element upon another in the toroid-forming machine by overcoming the normally adhering characteristics of the elements to the material of the conveying portion of the apparatus, brought about by the normally tacky nature of the elements. The impelling mechanism, therefore provides only one element at a time through a feeder to a toroid-forming portion of the toroid-forming machine, thereby resulting in a toroid of uniform size and shape. The use of the impelling mechanism further prevents clogging of the toroid-forming machine by enabling only a single element at a time to be fed to this machine, thereby improving product reliability and reducing the rejection rate of the manufactured toroids.

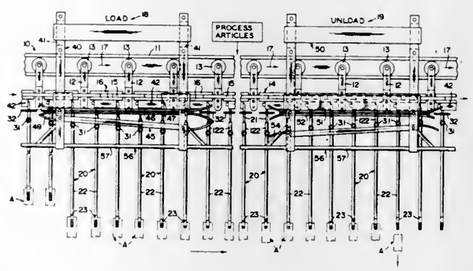
3,580,386
PORTABLE ELEVATOR FOR TOBACCO STICKS
Marcel M. Arnould, Newark, N.J.; John C. Ward, Jr., Clarendon; William Floyd Ray, Tabor City, N.C., and Boleslaw L. Budzyn, Passaic, N.J., assignors to Penstar Industries, Inc., South Plainfield, N.J.
Filed Apr. 1, 1969, Ser. No. 812,179
Int. Cl. B65g *15/00*
U.S. Cl. 198—131 **9 Claims**

A tobacco stick elevator having a pair of transversely spaced uprights with plates joining the top and bottom ends of the uprights. A motor driven endless conveyor chain passes around sprockets on the top and bottom plates. Longitudinally spaced socket bucket structures are fixed on the chain for removably receiving sticks loaded with tobacco leaves. Step units are fixed longitudinally along the uprights extending from one side thereof. A carriage is fixed on the uprights on the other side thereof adapted to ride on a track on a horizontal beam. A spacer frame is provided to hold the uprights away from a vertical supporting surface. Looped



handles are also provided for protecting the motor mounted on the bottom plate.

3,580,387
CONVEYOR ARTICLE SUPPORT APPARATUS
Jonathan W. King, Jr., Niles, Ohio, assignor to Georgia Pacific Corporation, Portland, Oreg.
Filed Jan. 23, 1969, Ser. No. 793,372
Int. Cl. B65g *17/20*
U.S. Cl. 198—178 **11 Claims**

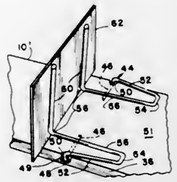


The conveyor article support apparatus relates to a driven conveyor moved through a fixed path and a plurality of hanger means pivotally attached to the conveyor and dependent therefrom, the hanger means including a movable article-piercing means, and control means for the article-piercing means movably positioned in the hanger means and having a control member operatively connected to the control means to move the article-piercing means to and from operative positions. Inclined plane means are fixedly positioned adjacent the conveyor path to engage the control member for moving the article-piercing means to and from operative positions for securing articles to the hanger means.

3,580,388
ATTACHMENTS FOR A FLEXIBLE BELT
Baird E. Resener, Indianapolis, Ind., assignor to Amsted Industries Incorporated, Chicago, Ill.
Filed Mar. 3, 1969, Ser. No. 803,776
Int. Cl. B65g *15/42, 19/00*
U.S. Cl. 198—198 **8 Claims**

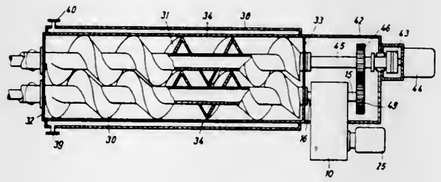
A wire member is secured to a belt by tangs projecting into

holes in the sides of the belt. Attachments are secured to the wire member proximate the upper surface of the belt. The



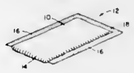
belt may have notches in its sides to retain the wire member flush with the side of the belt.

3,580,389
SCREW CONVEYOR
Friedrich Karl Nonnenmacher, Frankfurt am Main, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany
Filed Jan. 7, 1969, Ser. No. 789,508
Claims priority, application Germany, Jan. 25, 1968, P 1,653,872.0
Int. Cl. F28f *5/06*
U.S. Cl. 198—213 **6 Claims**



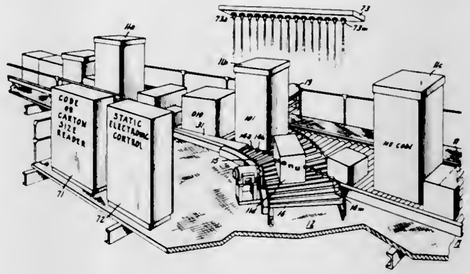
One of two parallel screws rotatable in the same direction in a screw conveyor is rotatable at different speeds from the other screw. This periodically brings the threads of one screw into wiping and cleaning engagement with the threads of the other screw.

3,580,390
PLASTER COLORANT SYSTEM
John D. Shull, Jr., Tonawanda, N.Y., assignor to National Gypsum Company, Buffalo, N.Y.
Filed Feb. 20, 1968, Ser. No. 706,920
Int. Cl. B65d *81/00, 85/00*
U.S. Cl. 206—46 **5 Claims**



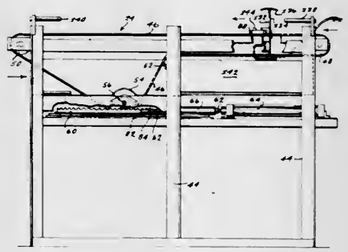
A set of water-soluble film packets each containing one of several available finely ground pigments and, when so desired, an additional amount of finely ground white extender, which are added singly or in any desired multiples to a container of gauging water to which is added a readily available standard quantity of dry cementitious powder, such as plaster, for providing controlled pigmented plaster for precolored plaster walls.

3,580,391
SOLID-STATE PULSED ELECTRONIC CONTROL FOR HIGH-SPEED CONVEYOR SORTING DEVICE
Derwood F. Littlefield, Ballston Spa, N.Y., assignor to General Electric Company, Detroit, Mich.
Filed Oct. 24, 1969, Ser. No. 869,120
Int. Cl. B07c *5/342*
U.S. Cl. 209—73 **15 Claims**



This invention comprises a static electronic control for a high-speed conveyor sorting device of the type having a plurality of serially arranged, electrically operable diverter pins which are selectively raised and lowered between the rollers of at least two conveyor paths to selectively control which conveyor path a particular carton passing through the device is caused to follow. For this purpose a classifying signal is developed by a code reader, carton size measuring circuit, or the like for developing signals indicative of the classification and hence which conveyor path cartons or other objects are to follow. In addition, electro-optical scanning devices are provided for identifying the position or location of a carton traveling along the conveyor sorting device and for developing electric signals indicative of such positions. The electric signals thus developed are processed in a logic circuit which derives output pulsed electric signals that can be applied to the actuating solenoid of a clutch release mechanism or a brake release mechanism of a constant speed apparatus for raising and lowering diverter pins along the conveyor path selectively in accordance with the pulsed electric signals supplied from the static electronic control.

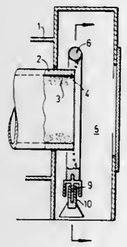
3,580,392
METHOD AND APPARATUS FOR REMOVING A FLACCID ARTICLE FROM A SUPPORT SURFACE
Leslie Starbuck, Nottingham, and Arthur F. Whymark, Loughborough, England, assignors to Speizman Industries, Inc., Charlotte, N.C.
Filed Aug. 19, 1969, Ser. No. 851,222
Int. Cl. B07c *3/06*
U.S. Cl. 209—74 **21 Claims**



Method and apparatus for removing a stocking or the like from a support surface (i.e., conveyor) on which the stocking is positioned with an end portion thereof hanging from the

edge of the support surface, including a pair of clamping elements and an operating arrangement therefor which initially disposes them at an open position with the hanging portion of the stocking located therebetween, then closes the clamping elements to grasp the hanging portion, then moves the clamping elements generally horizontally so as to pull the stocking off the support surface, then opens the clamping elements to release the stocking, and then returns the clamping elements to their initial position. Preferably, the clamping elements are disposed vertically to receive and grasp the stocking, and are moved to an inclined disposition when the stocking is released, the inclination being in a direction to cause the stocking to slide from between the open clamping elements. Also, the clamping elements are preferably moved from the support surface with sufficient speed to maintain the lengthwise extent of the stocking in a horizontal plane whereby the extended stocking can be collected in a receiver located beneath the path of movement of the clamping elements.

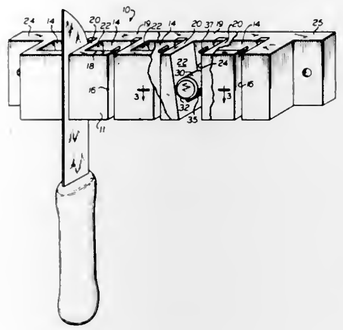
3,580,393
DEVICE FOR COLLECTING SOLIDS IN A CENTRIFUGE
Ernst Ruegg, Kusnacht, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland
Filed Oct. 17, 1969, Ser. No. 867,169
Claims priority, application Switzerland, Oct. 30, 1968, 16161/68
Int. Cl. B01d *21/26*
U.S. Cl. 210—369 **7 Claims**



In a continuously operating centrifuge for dewatering solids, having a housing and a drum rotatable in said housing, and a member made of flexible material, mounted in said housing, and surrounding at least part of the periphery of said drum, so that said solids issuing from said drum impinge on said member, the improvement that said member is elongated and includes a portion in the form of a toric segment, the toric segment extending substantially in the peripheral direction of said drum, and that said member is mounted to be rotatable in said housing about its longitudinal axis.

3,580,394
ARTICLE HOLDER
Michael Elliot, 513 W. 54th St., New York, N.Y.
Filed May 16, 1969, Ser. No. 825,357
Int. Cl. A47f *7/00*
U.S. Cl. 211—60 **6 Claims**

A holder for knives or the like implements, serving to maintain them with their cutting edges in a protected enclosed position, and permitting ready selective insertion and removal of the knife, or the like from the holder. The holder is formed by a block member having an interior vertically extending channel therein defined by a vertically extending surface spaced from an inclined surface, with the lower end of the inclined surface closer to the vertically extending surface. A locking member is loosely positioned in said channel for sliding between said surfaces, and a stop member at the lower end of said channel limits the downward movement of said locking member to prevent its being wedged into a jammed position between said surfaces, whereby a knife or the like inserted into said channel will be engaged by said locking member against said vertical surface. The locking member is formed with a chamfered leading edge serving the

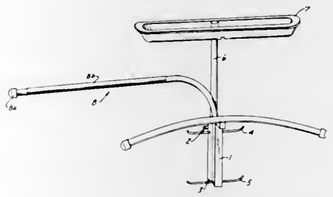


twofold function of implementing insertion of the knife blade and permitting honing of the blade.

3,580,395
INTENSIVE CARE APPARATUS
Robert L. Weaver, 153 Carol Lane, Toledo, Ohio, and Frank D. Myrice, 4700 Temperance Road, Ottawa Lake, Mich.
Filed June 30, 1969, Ser. No. 821,303
Int. Cl. A47f *5/08*
U.S. Cl. 211—87 **2 Claims**

Medical intensive care apparatus, capable of versatile accommodation to different spacial configurations which, as a unit, provides an adequate source of oxygen and a variety of complete suction requirements for installation adjacent to or within a wall at a position of convenience for a patient and medical personnel.

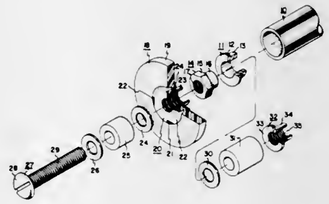
3,580,396
SILENT BUTLER
Johannes Dietz, P. O. Box 61.800, Caracas, Venezuela
Filed Mar. 4, 1970, Ser. No. 16,305
Int. Cl. A47f *5/08*
U.S. Cl. 211—88 **5 Claims**



A silent wall butler has a base member mountable on an upright surface of a support. A tray member is carried by said base member upwardly spaced therefrom. A first tubular hanger is connected to the base member projecting therefrom and being turnable about an upright axis. An arcuately curved second tubular hanger is rigidly mounted on the base member projecting beyond opposite lateral sides

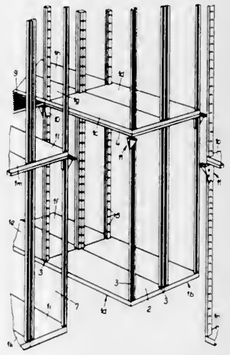
thereof. One or more third hangers are also provided on the base member and have end sections extending beyond the aforementioned opposite lateral sides of the base member.

3,580,397
UTILITY ROD AND MOUNTING CONSTRUCTION THEREFOR
Lee Triplett, Salt Lake, Utah, assignor to Expando Products Company, Magna, Utah
Filed Aug. 5, 1968, Ser. No. 750,289
Int. Cl. A47h *1/08, 1/10;* **F16b** *2/00*
U.S. Cl. 211—105.4 **1 Claim**



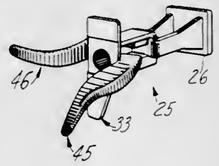
The present invention relates to rod constructions and, more particularly, to a new and improved elongate rod construction wherein the apparatus disposed at each end thereof is easily secured to the rod and is provided with friction-lock means, both for rod retention and for exterior mount placement, such that the apparatus can be easily manipulated to accomplish selective securement of opposite ends of the rod structure to the mounting members employed. In the preferred embodiment of the invention the adjustment wheels or equivalent devices used at the rod ends may be employed, not only to friction-lock the compression sleeves of the rod construction to their mounts, but also to apply a thrusting force against the oppositely disposed mounting members such that the same are retained tightly against and in tight friction engagement with the wall surfaces with which they are associated.

3,580,398
SHELVING SYSTEM
Manfred Schafer, Oberes Gerstenfeld, Germany, assignor to Fritz Schafer K. G., Neunkirchen Kreis Siegen, Germany
Filed July 16, 1968, Ser. No. 745,270
Claims priority, application Germany, July 25, 1967, Sch 43062/34i Gbm
Int. Cl. A47b *9/00;* **A47f** *5/00*
U.S. Cl. 211—148 **8 Claims**



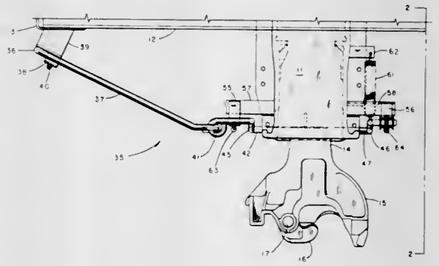
A shelving system consists of shelf units arranged in rows to form passages therebetween and floors or catwalks are provided in the passages at a height which permits operators to walk beneath such floors, the floors preferably consist of gratings or grids supported by brackets hooked on to uprights forming part of the framework of the shelf units.

3,580,399
AUTOMATIC TRAINLINE CONNECTOR
Donald Willison, Lyndhurst, and Kenneth L. Depenti, Mayfield Heights, Ohio, assignors to Midland-Ross Corporation, Cleveland, Ohio
Filed Oct. 29, 1969, Ser. No. 872,036
Int. Cl. B61g *7/06*
U.S. Cl. 213—76 **6 Claims**



A railway automatic trainline connector has a connector head provided with a pair of forwardly extending and outwardly diverging gathering wings, with one of the wings being provided with a guide rib facing the horizontal plane containing the longitudinal axis of the connector.

3,580,400
ROTARY UNCOUPLING DEVICES
Kenneth L. De Penti, Mayfield Hts., Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed Apr. 10, 1969, Ser. No. 815,139
Int. Cl. B61g *3/08*
U.S. Cl. 213—166 **5 Claims**

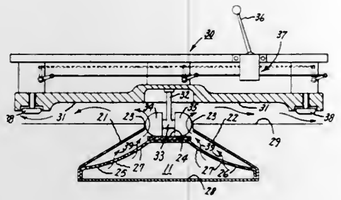


A coupler unlocking device for railway cars having a rotary coupler including a pivotally mounted arm connected to a coupler knuckle actuating mechanism and imposed in the path of movement of a bail type uncoupling rod assembly independently mounted on the end sill of the car. This improvement contemplates a preassembly of the coupler rotor and the operating arm and application of the rotor in interlock position with the knuckle actuating mechanism located within the coupler head, or removal of the rotor, without disassembly of the arm from the rotor.

3,580,401
MULTIPURPOSE AIR SUPPLY SYSTEM
Laddie L. Stahl, Rexford, N.Y., assignor to General Electric Company
Filed Dec. 12, 1968, Ser. No. 783,231
Int. Cl. B60r *3/04*
U.S. Cl. 214—1BE **5 Claims**

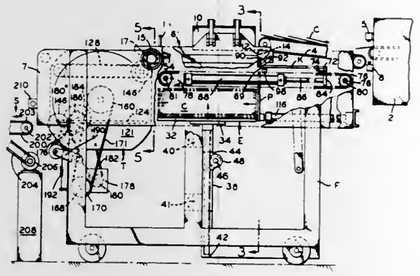
Air supply is provided by a network of longitudinal channel valves. Each channel valve includes a longitudinal channel member having an opening in the top wall thereof.

Another longitudinal member seated against the underside of the top wall hermetically seals the channel member except



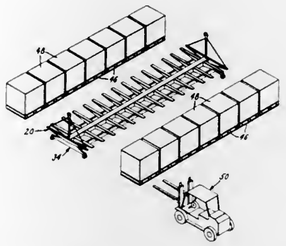
when depressed by a plunger from an air cushion support vehicle or by fixed depressors.

3,580,402
APPARATUS FOR AUTOMATICALLY STACKING AND INVERTING STACKED UNITS OF SHEET MATERIAL
Ingvar L. Tolf; Vernon J. Herzing; Everett L. Miller, Battle Creek, and George L. Lightfoot, Bellevue, Mich., assignors to General Foods Corporation, White Plains, N.Y.
Filed Jan. 30, 1969, Ser. No. 795,187
Int. Cl. B65g *57/11*
U.S. Cl. 214—6C **19 Claims**



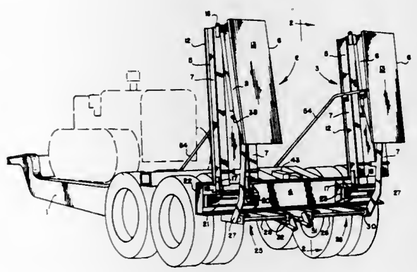
This specification discloses a machine for forming stacks or piles of sheet material, such as flat carton blanks (hereinafter also referred to merely as cartons), and delivering them in properly arranged and oriented condition to a receiving station where they are available for setup or shipment. Cartons are conveyed from a cutting press to an assembly magazine in one or more laterally spaced single file lines. Each line of cartons entering the magazine is jogged or shuffled to form a neat stack or pile on a vertically movable elevator in the magazine. In response to the action of sensing mechanism the elevator is lowered progressively carrying with it the piled cartons until a controlled separator is moved between adjacent cartons of the piled cartons and separates stacks of desired height or number of cartons therefrom, whereupon the elevator is lowered to a predetermined position. A horizontally movable pusher is then operative to push each stack beneath the separator from the elevator into an inverting turret and dispose it or them between opposed relatively movable clamping and conveying means carried thereby. The turret is rotated 180° thereby inverting the stacked cartons which are then unclamped and traveled by the turret conveying means out of the turret and delivered onto a receiving station. The turret is so designed that it accommodates itself to operate satisfactorily with cartons over a wide range of carton size and thickness, within the limits of the machine, which results in a machine having great versatility and capacity.

3,580,403
MATERIALS HANDLING APPARATUS
Thomas Lancashire, West Chester, Pa., assignor to The Boeing Company, Seattle, Wash.
Filed Oct. 30, 1968, Ser. No. 771,955
Int. Cl. B66c *1/00;* **B64c** *1/22*
U.S. Cl. 214—38 **8 Claims**



Materials handling apparatus for integrating a plurality of individual loads. A supporting structure includes a plurality of fingers which extend transversely in opposite directions from an elongated beam at spaced locations along the beam. Positioned in a substantially horizontal plane, the fingers are adapted to support individual loads such that they can be raised as a unit upon elevation of the structure. A cradle is provided for moving the supporting structure across a surface and, in a modified embodiment, the fingers can be folded to a retracted position for storage.

3,580,404
LOADING RAMPS FOR TRAILERS
William J. Moser, 2075 Leaf Terrace, Coos Bay, Oreg.
Filed July 31, 1969, Ser. No. 846,523
Int. Cl. B60p *1/44*
U.S. Cl. 214—85 **5 Claims**

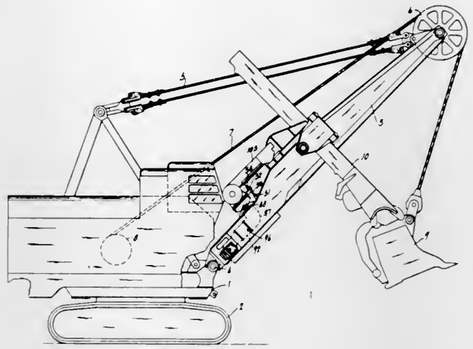


Ramp assemblies are disclosed mounted upon the rear of a lowboy-type trailer for loading construction equipment. Each assembly is of two hingedly attached sections collapsible to a raised, stowed positions by an arm engageable with both of the sections to lift same and to maintain same in a stowed position. A hydraulic circuit is included for selective control of each ramp assembly.

3,580,405
MULTIPLE V-BELT DRIVE FOR A CROWD MECHANISM OF A POWER SHOVEL
Charles R. Siegel, Cudahy, and Karl Schneider, Greenfield, Wis., assignors to Harnischfeger Corporation, Milwaukee, Wis.
Filed Apr. 23, 1969, Ser. No. 818,641
Int. Cl. E02f *3/00*
U.S. Cl. 214—135 **19 Claims**

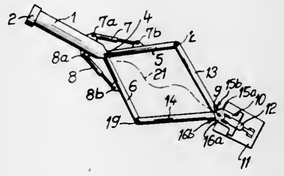
Crowd driving mechanism for the dipper stick of a power

shovel, and also including a multiple V-belt and means for



tensioning the same. An air supply inside the boom for cooling the belt and motor.

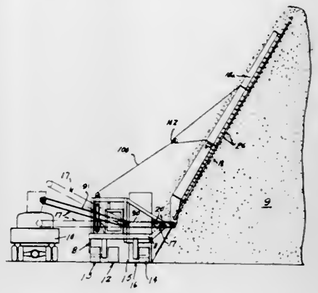
3,580,406
EARTHWORKING MACHINE
Jean-Pierre B. Bellart, Senlis, France, assignor to Societe Anonyme Poclain, Le Plessis, Belleville, France
Filed Aug. 18, 1969, Ser. No. 850,941
Claims priority, application France, Sept. 5, 1968, 165170
Int. Cl. E02f *3/00*
U.S. Cl. 214—137 **10 Claims**



The invention relates to an earthworking machine in which an earthworking implement, such as a drag bucket, is carried by extensible and retractable means to effect forward and backward movement of the bucket, the invention consisting in an improved form of extensible and retractable means which comprises two pairs of arms pivoted together to form a deformable quadrilateral which is pivoted at one of its ends to the jib and has pivoted to its other end the bucket assembly.

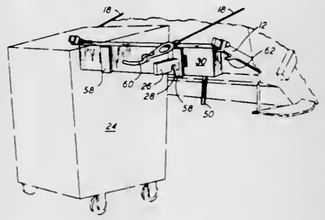
3,580,407
METHOD OF RECLAIMING BULK MATERIAL
Fred T. Smith, Aurora, Ill., assignor to Barber-Greene Company, Aurora, Ill.
Original application Oct. 24, 1965, Ser. No. 504,739, now abandoned. Divided and this application June 4, 1968, Ser. No. 739,930
Int. Cl. B65g *65/28*
U.S. Cl. 214—152 **8 Claims**

The present invention is directed to a method for converting a stockpile of material into a moving stream of material for loading into another area. More specifically, the method comprises digging into an angled side face of a pile at its lower end along a continuous path of the length of the side face, creating a first upward arcuate stream of material, creating a second stream of material by digging the angle side face of the pile over an upper area which extends above the



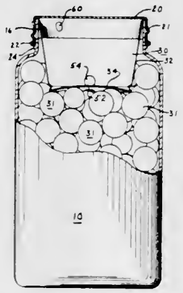
lower end, merging the two streams of material into a main stream which is directed angularly from the side face.

3,580,408
RECEPTACLE DISPOSAL CONTAINER ADAPTER
Augustus L. Newton, 211 Riverthorn Road, Baltimore, Md.
Filed Nov. 13, 1969, Ser. No. 876,441
Int. Cl. B65f *3/02*
U.S. Cl. 214—302 **5 Claims**



An auxiliary device for adapting small containers to the hoist and dump arms of disposal vehicles is provided. A spanning bar to fit the usual load arms is provided with locking apertures to receive the narrower spaced lugs of containers for ready handling of same with the usual equipment.

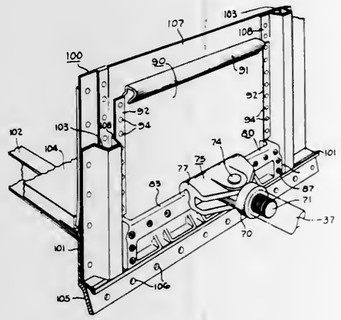
3,580,409
FRUIT AND VEGETABLE JAR SUPPRESSOR DEVICE
Henry J. Soboleski, 1745 Kessler, South Bend, Ind.
Filed Oct. 9, 1969, Ser. No. 864,980
Int. Cl. B65d *51/14*
U.S. Cl. 215—81 **9 Claims**



A fruit and vegetable jar suppressor device of a one-piece cup-shaped body construction having sidewalls which taper

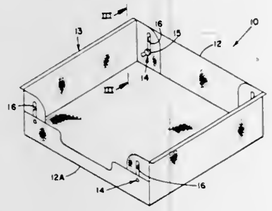
inwardly and downwardly and having a bottom joined integrally to the lower edge of the sidewalls. The bottom preferably is concave upwardly and contains a center hole for the admission of liquid in the fruit of vegetable jar into the device while suppressing the fruit and vegetable solid material in the jar. The cup-shaped body is of flexible plastic material capable of adapting itself to jars with variations in the diameter of the opening.

3,580,410
COUPLING DEVICE FOR CONTAINER HANDLING SYSTEM
Andrew Abolins, Langhorne, Pa., assignor to Strick Corporation, Fairless Hills, Pa.
Original application June 12, 1967, Ser. No. 645,157, now Patent No. 3,460,867, dated Aug. 12, 1969. Divided and this application Feb. 13, 1969, Ser. No. 828,030
Int. Cl. B65j *1/02*
U.S. Cl. 220—1.5 **1 Claim**



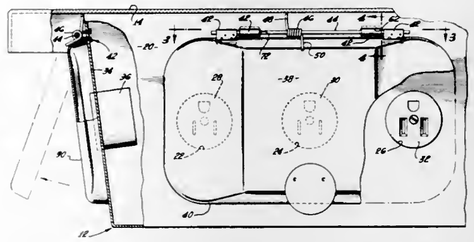
Herein are disclosed new and improved coupling means, and container assemblies and an article handling device which embody same, for use in a system for handling container assemblies, and particularly for transferring container assemblies to and from highway carriers, railway carriers and other mobile and stationary structures. The container assemblies are either of the typical, removable-bogey, highway trailer body type, or are containers with separable chassis equipped with the customary equipment for highway transportation.

3,580,411
CONTAINER HAVING MOVEABLE WALL
Oscar F. Mills, Grand Prairie, Tex., assignor to LTV Aerospace Corporation, Dallas, Tex.
Filed Feb. 13, 1969, Ser. No. 798,959
Int. Cl. B65d *7/00*
U.S. Cl. 220—4 **8 Claims**



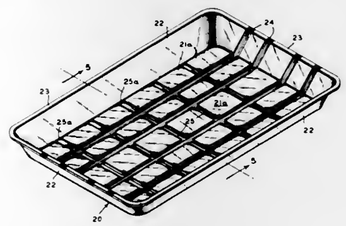
An open-top container or skid having a base, two spaced and parallel sidewalls, and at least one sidewall which is moveable between an upstanding position and a stored position, with the stored position being a position wherein said moveable sidewall lies flat against the base.

3,580,412
HINGE STRUCTURE FOR ELECTRIC POWER DISTRIBUTION BOX OR THE LIKE
Hubert L. Weiss, Los Angeles, Calif. (c/o American Construction Equipment Co., Inc. 5055 W. Jefferson Blvd.)
Continuation of application Ser. No. 724,187, Apr. 25, 1968, now abandoned. This application Nov. 10, 1969, Ser. No. 875,416
Int. Cl. B65d *43/16, 51/10*
U.S. Cl. 220—35 **7 Claims**



A hinge structure is provided by hinge knuckle elements snapped into position at apertures of the members designed to be hingedly connected. The hinge knuckles are provided with stop flanges and spring means to secure the hinge knuckles in position. A straight hinge pin interconnects the knuckles and the members to be connected, and is restrained against longitudinal movement by the friction imposed by the lateral thrust of a cover closing spring.

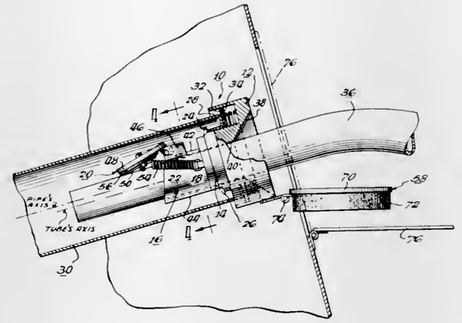
3,580,413
CLEAR THERMOPLASTIC MULTI-PLY MEAT TRAY AND ABSORBENT STRIPS
John J. Quackenbush, Monroe, Conn., assignor to National Distillers and Chemical Corporation, New York, N.Y.
Filed Jan. 27, 1969, Ser. No. 795,141
Int. Cl. B65d *7/42*
U.S. Cl. 220—83 **8 Claims**



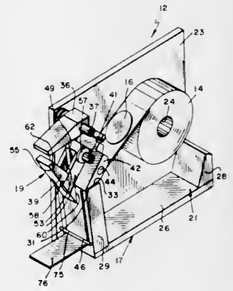
A clear, plastic tray, and a method for the production thereof, intended for the packaging of food products, such as meats, and the like, where the package contents will be clearly visible. The tray is completely transparent and is produced from sheet material which includes a preinserted strip or plurality of strips of absorbent cellulosic material for the reception and retention of any fluid or fluids which may drain from the package contents subsequent to the packaging.

3,580,414
FUELING DEVICE FOR AUTOMOBILES AND THE LIKE
Irwin Ginsburgh, Morton Grove, Ill., and Hilbert J. Nebelsiek, Hammond, Ind., assignors to Standard Oil Company, Chicago, Ill.
Filed Dec. 20, 1968, Ser. No. 785,562
Int. Cl. B65d *39/02*
U.S. Cl. 220—86 **9 Claims**

Our invention concerns a device adapted to be attached to the fill pipe of an automobile's gas tank and to receive the nozzle of a fuel dispenser. Its principal elements are: a cap member having means which enable said cap member to be attached to the fill pipe, a passageway through the cap member which is adapted to pass the nozzle, and a closure member connected to one end of the passageway which seals said passageway, but which opens whenever the nozzle is inserted into the passageway. The passageway has one end protruding from the fill pipe and another end extending into the fill pipe. The closure member may be attached to either end, or two closure members can be employed, one attached to each end.



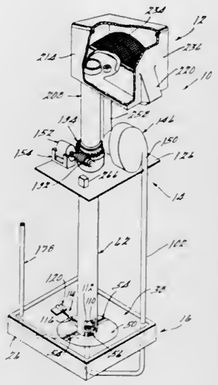
3,580,415
DECAL DISPENSING APPARATUS
Harvey T. Hollinger, Concordia, Kans.
Filed Aug. 11, 1969, Ser. No. 848,950
Int. Cl. B65h *5/28*
U.S. Cl. 221—74 **7 Claims**



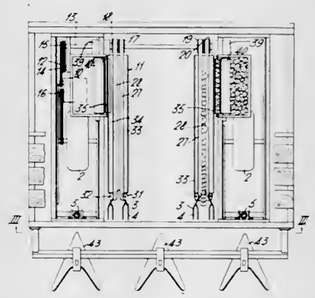
This invention relates to a dispensing apparatus operable to dispense decal members carried upon a roll of paper tape through the use of an actuator mechanism adapted to automatically pick up and hold the decals on longitudinal movement of the tape. More particularly, the dispensing apparatus includes an actuator mechanism provided with cooperating male and female actuator arms to grasp and hold the decal member until one desires to remove the same for applying to food products or the like.

3,580,416
METHOD AND APPARATUS FOR DISPENSING ICE CUBES AND THE LIKE
Walter H. Hoenisch, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.
Continuation-in-part of application Ser. No. 606,852, Jan. 3, 1967, now abandoned. This application Nov. 12, 1968, Ser. No. 775,094
Int. Cl. B65h *3/60*
U.S. Cl. 221—203 **89 Claims**

A method and apparatus for transferring ice cubes and the like from a storage compartment to a remotely located dispensing compartment, the apparatus comprising passage means extending between the storage compartment and dispensing compartment and means providing a flow of conveying fluid through the passage means of sufficient magnitude to cause ice cubes to be conveyed through the passage means; an ice cube agitating mechanism for selectively agitating ice cubes within the dispensing compartment and for effecting movement thereof toward the passage means, and a discharge chute disposed adjacent one end of the passage means.

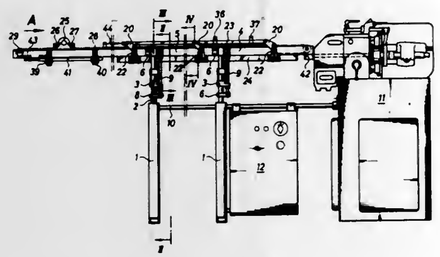


3,580,417
MACHINES FOR PLANTING TUBERS AND THE LIKE
Peter Alfred Hobbs, St. Albans, England, assignor to National Research Development Corporation, London, England
Filed July 1, 1968, Ser. No. 741,759
Claims priority, application Great Britain, July 5, 1967, 31079/67
Int. Cl. B65h *5/00*
U.S. Cl. 221—224 **7 Claims**



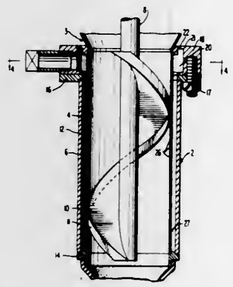
A machine for planting tubers, corms, bulbs or the like, such as potatoes, of the kind in which at least one coulter is adapted to draw a furrow in the soil as the machine is moved forward and means are provided for delivering a succession of the tubers from a supply carried by the machine on to driven belt means which are adapted to feed the tubers into furrow, has the belt means arranged to cause rotation of the tubers at least at some part of their travel along the belt means. The belt means may comprise a delivery trough of which one side at least comprises a continuous belt adapted to be driven at a speed related to the land speed of the machine but preferably both sides of the delivery trough comprise continuous driven belts and the belts are then arranged to be driven at substantially different speeds. The induced rotation of the tubers causes them to string out into line and substantially avoids the presentation of "doubles" to the furrow.

3,580,418
APPARATUS FOR FEEDING ROD STOCK AND THE LIKE
Johannes Werkmeister, Reichenbach (Fils), and Holger Scheler, Faurndau, Germany, assignors to Firma Hermann Traub, Reichenbach (Fils), Germany
Filed June 9, 1969, Ser. No. 831,349
Claims priority, application Switzerland, June 17, 1968, 8989/68
Int. Cl. B65g *59/00*
U.S. Cl. 221—275 **7 Claims**



An apparatus for feeding rod-shaped workpieces by means of a feed rod along a trough-shaped channel in a guide rail to a machine tool. During the feeding operation the upper side of the channel in the guide rail is closed by a stationary cover rail, and when the channel is empty, the guide rail is lowered from the cover rail by a plurality of levers which are mounted at one lateral side of the rails so that a new workpiece may be inserted from a magazine rack which is mounted at the other lateral side of the rails.

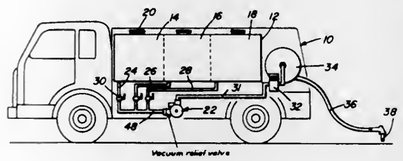
3,580,419
METHOD AND APPARATUS FOR FEEDING AND COMPACTING FINELY DIVIDED PARTICULATE MATERIAL
Clarence F. Carter, Danville, Ill., assignor to Carter Engineering Company, Danville, Del.
Filed Apr. 2, 1968, Ser. No. 718,123
Int. Cl. B67d *5/88*
U.S. Cl. 222—1 **7 Claims**



A method of feeding and compacting finely divided particulate material, which utilizes a rotating screw feeder for advancing the material along a sleeve passage provided by a stationary foraminous sleeve mounted closely about the screw feeder. The method includes the steps of advancing the particulate material axially along the sleeve with the interstitial air between the particles in the sleeve at an internal sleeve pressure. Suction pressure relatively lower than the internal sleeve pressure is applied to the exterior of the sleeve to withdraw air from between the particles of the material to effect compaction of the material. At predetermined times gas pressure relatively higher than the internal sleeve pressure is applied to the exterior of the sleeve to back-flush material from openings in the sleeve to prevent clogging thereof.

An apparatus for feeding and compacting finely divided particulate material, which includes a housing having fixedly mounted therein a tubular sleeve. The sleeve and housing define at least one closed hollow chamber extending about the sleeve with a plurality of perforations in the sleeve placing the interior thereof in fluid communication with the interior of the chamber. An axially extending screw feeder concentrically and rotatably mounted in the sleeve is adapted to advance material axially along the sleeve, with the interstitial air present between the particles of material in the sleeve at an internal sleeve pressure. Suction means in fluid communication with the chamber applies suction pressure relatively lower than the internal sleeve pressure to withdraw air from between the particles of material to affect compaction thereof. Gas pressure means in fluid communication with the chamber provides gas at a relatively higher pressure than the internal sleeve pressure at predetermined times to backflush particulate material from the perforations, to prevent clogging thereof.

3,580,420
EVACUATION SYSTEM FOR PIPELINE DISCHARGING PUMP
Garth P. Kennedy, and William E. Nelson, Oklahoma City, Okla., assignors to Corken Pump Company
Filed Jan. 27, 1969, Ser. No. 794,264
Int. Cl. B67d *5/04*
U.S. Cl. 222—1 **5 Claims**



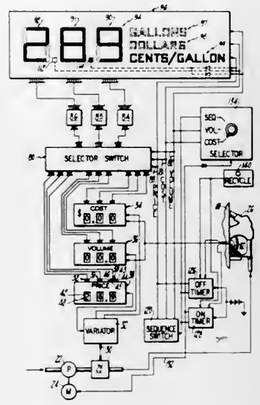
A vacuum relief valve installed on the suction side of a pump employed with a compartmented tank on a fuel delivery vehicle or the like to enable the pump and associated piping system to be completely purged of fuel that has been conveyed by the pump from one compartment to a delivery nozzle before the piping system for the pump is communicated with another compartment of the tank having a different fuel therein for eliminating contamination of one fuel with another during sequential delivery of various types of fuel from the various compartments of the multicompartment tank to a delivery point.

ERRATUM

For Class 222—5 see:
Patent No. 3,579,964

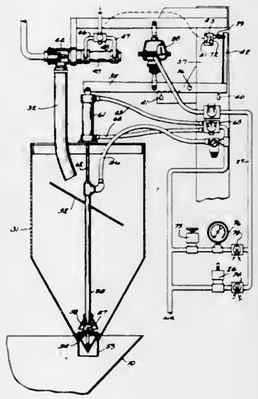
3,580,421
FLUID DISPENSING APPARATUS INDICATOR SYSTEM
John H. Bickford, Middletown, Conn., assignor to Veeder Industries Inc., Hartford, Conn.
Filed Nov. 20, 1969, Ser. No. 878,319
Int. Cl. B67d *5/16*
U.S. Cl. 222—27 **30 Claims**

A fuel dispensing system having an indicator subsystem with a liquid crystal indicating device adapted to be operated for displaying, one at a time, the established unit volume price of fuel, the volume of fuel delivered and the total cost of the fuel delivered. A sequencing switch provides for operating the indicating device to display the cost, volume and price information in sequence at the beginning and end of a fuel delivery and a manual selector provides for selectively operating the indicating device to continuously display the cost or volume or sequentially display the cost, volume and price during the delivery. The price is displayed between deliveries and a recycle button provides for temporarily displaying the cost, volume and price information both during and between deliveries. A two-product dispensing system schematically shown in FIG. 2 comprises two indicator



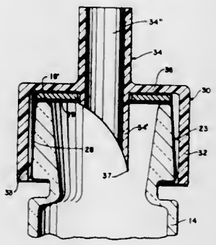
subsystems and a manual selector for selection the product information to be displayed by each subsystem.

3,580,422
APPARATUS FOR ADDING FINELY DIVIDED SOLID MATERIAL TO A MIXTURE
Nelson Hartley, Towson, Md., assignor to Hartley Controls Corporation, Neenah, Wis.
Filed Nov. 25, 1968, Ser. No. 778,422
Int. Cl. B67d *5/56*
U.S. Cl. 222—57 **8 Claims**



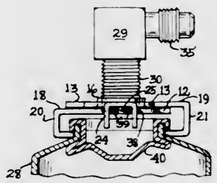
This disclosure relates to apparatus for adding both a liquid and a finely divided solid to a mixture and in which the quantity of finely divided solid that is added is measured in direct proportion to the liquid deficiency of the mixture and in which the mechanism for measuring out the addition of finely divided solid is directly responsive to a liquid deficiency sensing mechanism which operates a reversible motor. The motor turns a shaft which controls both the liquid deficiency make-up mechanism and the finely divided solid make-up mechanism. The device is particularly adapted for bond compensation in a foundry where the mixture is foundry sand, water, and bond.

3,580,423
CONTAINER CLOSURE AND APPARATUS FOR OPENING SAME
John M. Gilman, Cincinnati, Ohio, assignor to The Realistic Company, Cincinnati, Ohio
Filed Feb. 27, 1969, Ser. No. 802,821
Int. Cl. B67b *7/30*
U.S. Cl. 222—81 **6 Claims**



A closure for a container which includes an impervious disc and can also include a resilient annulus overlying the mouth of the container. A retaining ring attached to the container adjacent the mouth having an inwardly directed flange overlies the disc and the annulus to hold the disc and the annulus firmly in assembled relation forming a seal with the mouth. A cap having a tubular spout with a pointed inner end perforates the disc to discharge contents of the container.

3,580,424
DISPENSING VALVE FOR A SEALED PRESSURIZED CONTAINER
Virgil Philipps, Chicago, Ill., assignor to Federal Auto Products Co., Inc., Chicago, Ill.
Filed Oct. 27, 1969, Ser. No. 869,592
Int. Cl. B67b *7/26*
U.S. Cl. 222—89 **5 Claims**



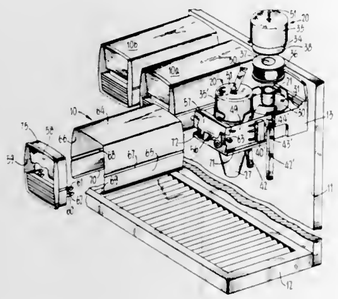
A dispensing valve carried by a connector adapted to clamp upon the bezel of the container so as to center the valve thereon and to pierce and seal the closed top of the container.

The valve comprises a valve head, a penetrating dispensing tube and a seal. When the valve is clamped on to the bezel of the container the valve head is threaded through the clamping connector causing the seal to contact the top of the container at the point of penetration thereof by the dispensing tube. The valve and the connector can be removed and reused when the contents of the pressurized container have been dispensed.

3,580,425
BEVERAGE DISPENSER
Heiko T. DeMan, Morago, Calif., assignor to Electronic Dispensers International, Oakland, Calif.
Filed Sept. 26, 1968, Ser. No. 762,760
Int. Cl. B67d *5/56*
U.S. Cl. 222—129.1 **10 Claims**

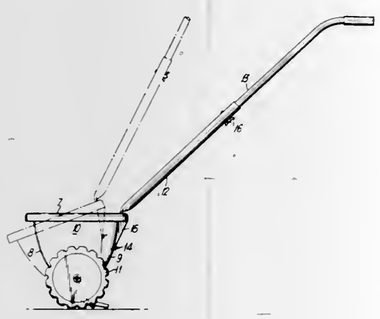
A beverage dispenser for selectively or concurrently dispensing syrup and carbonated water therefrom. The

discharge of such fluids from the dispenser is controlled by a pair of solenoid operated valves respectively associated with switches actuated by levers that depend from the dispenser adjacent the discharge nozzle thereof. The dispenser includes a body structure supporting the various functional components of the dispenser, and a resilient cover slidably related to the body structure is readily removable therefrom to



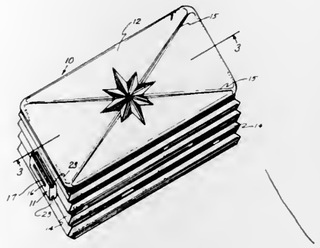
provide access to such switch devices, valve parts, and the solenoid controls for the valves. The dispenser further includes a face piece cooperative with the cover in enclosing such functional components, and the face piece is snap-connected with the body structure so as to be easily removed therefrom in providing access to the functional components of the dispenser.

3,580,426
FERTILIZER DISTRIBUTOR
Peter R. J. Manning, Southfields, England, assignor to Tri-Ang Toys Limited, London, England
Filed July 17, 1969, Ser. No. 842,548
Claims priority, application Great Britain, July 18, 1969, 34284/68
Int. Cl. A01c *15/00*
U.S. Cl. 222—177 **7 Claims**



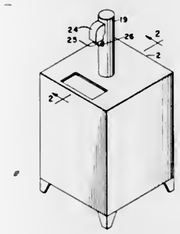
A garden fertilizer distributor comprises a hopper having a bottom outlet and supported on a pair of wheels mounted one on each end of a roller. The roller is formed with longitudinal pockets which deliver metered quantities of the fertilizer to the outlet as the roller rotates with the wheels in use. A closure plate is pivoted on the hopper and is spring loaded to a position in which it closes the hopper outlet. Two marker fingers are rigid with the closure plate and engage the ground when the hopper is tilted to a position of use and thereby swing the closure plate about its pivot away from the hopper outlet to permit delivery of fertilizer through the outlet.

3,580,427
CREAM DISPENSER WITH PLEATED WALLS AND LIP TYPE OPENING
Robert E. Clarke, 1410 Saratoga Drive, Bel Air, Md.
Filed Nov. 8, 1968, Ser. No. 774,384
Int. Cl. B65d *37/00*
U.S. Cl. 222—215 **1 Claim**



A cream dispenser in the form of a container of flexible material such as plastic having generally flexible top and bottom walls and pleated, collapsible sidewalls, an opening in one sidewall in the form of an elongated slit, flexible lips along the opposite sides of the slit, the lips normally closing the slit but being deflectable outwardly to permit discharge of the contents upon pressure being applied to container to collapse the same and said lips being deflectable inwardly upon insertion of a nozzle to recharge the dispenser and a removable closure for the opening.

3,580,428
ICE DISPENSING MACHINE
Howard A. Garber, 1010 First Ave., Richmond, Va.
Filed Mar. 15, 1969, Ser. No. 816,316
Int. Cl. B67d *5/52;* **G01f** *11/10*
U.S. Cl. 222—241 **10 Claims**

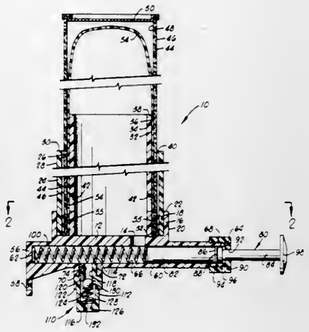


An ice dispensing machine having an insulating casing with a platform adjacent the bottom for supporting a mass of flaked ice with a rotatable impeller mounted adjacent the bottom of the mass of ice to shave the ice therefrom and direct such ice to a vertically extending conveyor for carrying the ice upwardly to a discharge spout with a receptacle actuated lever for starting the operation of the impeller and conveyor.

3,580,429
PASTE DISPENSER WITH INTERCHANGEABLE BAGGED CARTRIDGES
John P. Trindle, Oklahoma City, Okla., assignor to Robert L. Fairbanks, Oklahoma City, Okla.
Filed Dec. 10, 1968, Ser. No. 782,550
Int. Cl. G01f *11/06*
U.S. Cl. 222—327 **10 Claims**

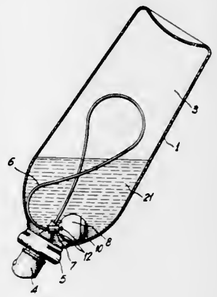
A dispenser for dispensing a measured amount of nonsolid material such as, for example, paste hand cleaner, the dispenser receiving interchangeable cartridges containing the fluid material in operative affixture, and including a manually

depressible extracting valve in communication with the paste material and serving to dispense a proportionate amount upon depression of the valve; the cartridge including a liner



protecting the paste material from exposure to the surrounding air, the liner also being secured within the cartridge to regulate the evacuation of the paste material.

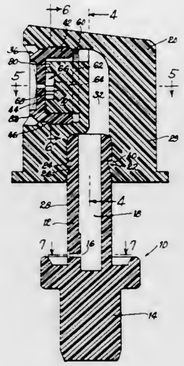
3,580,430
AEROSOL CONTAINERS
Henry Angele, Riscle, Gers, France, assignor to Etablissements Valois, Marly-le-Roi, Yvelines, France
Filed Apr. 22, 1969, Ser. No. 818,274
Claims priority, application France, Apr. 25, 1968, 149,367
Int. Cl. B65d *83/14*
U.S. Cl. 222—394 **8 Claims**



A liquid-dispensing (e.g. aerosol) container has a long plunger tube with a free end weighted by a cup and a ball carried thereon, the ball being embraced in fluidtight manner by the cup with formation of a void therebetween communicating on the one hand with the bore of the tube and on the other hand with the interior of the container via one or more passages in the cup.

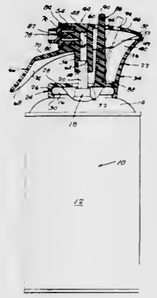
3,580,431
AEROSOL VALVE TIP AND STEM ASSEMBLY AND METHOD OF ASSEMBLING SAME
Clarence O. Kuffer, Niles, and Thomas McAvoy, Roselle, Ill., assignors to Valve Corporation of America
Continuation of application Ser. No. 703,103, Feb. 5, 1968, now abandoned. This application Mar. 20, 1970, Ser. No. 21,251
Int. Cl. B65d *83/00*
U.S. Cl. 222—402.1 **8 Claims**

This application describes and illustrates a method of making an aerosol valve tip and stem assembly and the interlocked assembly. The interlocked assembly is comprised of a tip and stem, one being a hard material defining a recess or notch, and the other being of a soft cold-flowable material that is caused to cold-flow into the notch when the two mem-



bers are telescopically assembled. When the members are assembled, the soft cold-flowable material cold-flows into the notch to interlock the members and to make disassembly thereof difficult.

3,580,432
ACTUATING MECHANISM FOR PRESSURIZED FLUID DISPENSER
Ray G. Brooks, 2505 Custer Court, Irving, Tex.
Filed July 16, 1969, Ser. No. 842,201
Int. Cl. B65d *83/00*
U.S. Cl. 222—402.13 **7 Claims**

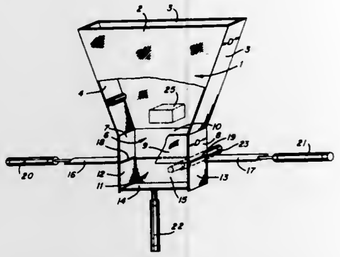


An actuating mechanism for pressurized fluid dispensers involves a cap having a pillar with a hinged body carrying a tubular element engageable with the dispenser spout. The mechanism includes a trigger secured to the body whereby the application of force to the trigger depresses the body with the consequent movement of the tubular element and spout. Changeable nozzles direct the spray to selected target areas, and a locking system prevents inadvertent spray emission.

3,580,433
CIGARETTE TUBE PACKAGING APPARATUS
Arnold Kastner, 10220 Armand Lavergne, Montreal North 39, Quebec, Canada
Filed Mar. 3, 1969, Ser. No. 803,796
Claims priority, application Canada, Nov. 13, 1968, 035,079
Int. Cl. G01f *11/28*
U.S. Cl. 222—440 **16 Claims**

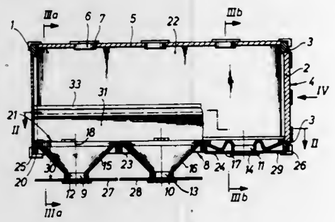
A packaging apparatus for cigarette tubes including a supply hopper for the cigarette tubes and a chamber posi-

tioned beneath the supply hopper and in communication therewith. And at least one separation blade mounted for horizontal reciprocal movement to project into the chamber



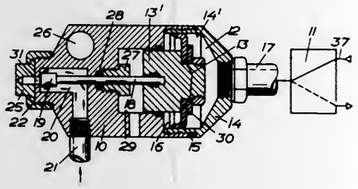
and divide the supply hopper and the chamber. The chamber having a vertically reciprocal bottom panel and a horizontally reciprocal rear panel and an open front.

3,580,434
CONVERTIBLE TRANSPORT CONTAINER WITH PLURAL FUNNEL-TYPE OUTLETS
Artur Spitzer, Mosbach, Baden, Germany, assignor to Ludwig Spitzer Sen. KG (Kommanditgesellschaft), Sonnenhalde, Germany
Filed Aug. 26, 1968, Ser. No. 755,284
Claims priority, application Germany, Oct. 9, 1967, S112326
Int. Cl. B67c *11/00*
U.S. Cl. 222—461 **6 Claims**



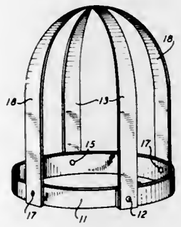
A rectangular, stackable shipping container having top filling openings, a dustproof end closure in the form of hinged doors, and a plurality of collapsible funnel discharge openings. The funnels occupy a minimum amount of space when collapsed and enable the full use of the available container volume.

3,580,435
SPRAY GUN WITH PRESSURE OPERATED VALVE
Alf Georg Bertilsson, Harlingstorp, Axvall, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden
Filed Apr. 15, 1968, Ser. No. 721,304
Int. Cl. B67d *5/06*
U.S. Cl. 222—504 **6 Claims**



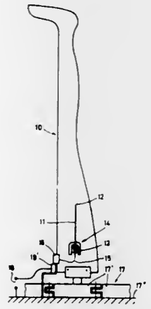
In a spray gun the supply of coating material to the nozzle means of the gun is controlled by a pressure fluid-actuated differential servo piston means dividing the cylinder thereof in a first cylinder chamber around the stem and a second cylinder chamber opposite to the first cylinder chamber. During both strokes of the servo piston means the first cylinder chamber is pressurized by pressure fluid. A maneuvering valve is provided for either supplying pressure fluid to the second chamber for producing one of the strokes of the servo piston means against the action of pressure fluid in the first chamber, or relieving the pressure fluid in the second chamber for releasing the other stroke of the servo piston means under the action of said pressure fluid in the first chamber. More particularly the servo piston means may be of tandem design for quick actuation.

3,580,436
DEMOUNTABLE WIG STAND
Eugene W. Di Luco, 1760 Miriam St., North Brunswick, N.J.
Filed Apr. 7, 1970, Ser. No. 26,252
Int. Cl. D06f *59/00;* **A41h** *5/00*
U.S. Cl. 223—66 **6 Claims**



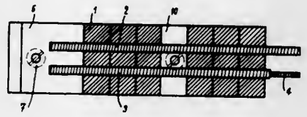
A demountable wig stand provided with a strip, the opposite ends of which are attachable together to form a base; and having a second strip attached to the first strip at one end, and also attachable at its other end to the first strip; a third strip is attached medially to the middle of the second strip, with its ends attachable to the base, to define a cagelike stand for a wig.

3,580,437
METHOD AND APPARATUS FOR MAKING HIP STOCKINGS FOR PANTY HOSE AND THE LIKE
Fritz Vorberg, Bischofswiesen-Winkl, Germany, assignor to Globotex AG, Zug, Switzerland
Filed Feb. 10, 1969, Ser. No. 797,847
Claims priority, application Germany, Mar. 5, 1968, G52570
Int. Cl. D06c *5/00*
U.S. Cl. 223—75 **10 Claims**



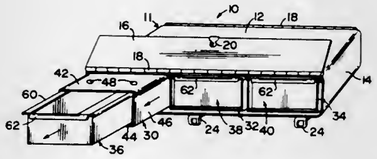
A method of making stockings for panty hose comprising the steps of placing a crude stocking on a hose mold for shaping and treatment and making an elongated cut in the texture of said stocking while in place on said hose mold. The apparatus of the invention includes a shaped hose mold for shaping and treatment of a hip length stocking placed thereon and a cutting means is mounted on the hose mold or in the path of said mold for making a precise elongated cut in the hip portion of a stocking which is placed on the hose mold so that a pair of said stockings may later be assembled into a pair of panty hose or may be worn as hip-high stockings.

3,580,438
WRISTBAND
Jean Ernest Paul Raval, rue du Lac, 2416 Les Brenets, Switzerland
Filed Nov. 26, 1968, Ser. No. 778,925
Claims priority, application Switzerland, Nov. 28, 1967, Mar. 26, 1968, 16713/67;4476/68
Int. Cl. A44c *5/00*
U.S. Cl. 224—4 **13 Claims**



A wristband formed of elements assembled in end to end relationship and mounted on at least one flexible assembly wherein the said assembly is constituted by a helical spring surrounding a clamped extruded steel wire.

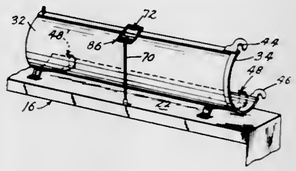
3,580,439
VEHICLE LUGGAGE CARRIER
Lawrence A. Jewett, 17383 Greenbrier Drive, Strongsville, Ohio, and Walter C. Jewett, Box 245 Gripps Road, Willington, Ohio
Filed Mar. 4, 1969, Ser. No. 804,243
Int. Cl. B60r *9/04*
U.S. Cl. 224—42.1 **8 Claims**



A vehicle top luggage carrier having a container removably fastened to the top of a vehicle. The container has a top, bottom, sides and an opening in front and back to permit access to the inside of the container. Hinged doors cover the openings. Drawer shells are slidably received through the openings in the container and themselves have a top, bottom and sides. The front and back of the shells are open to permit drawers to be slidably received in the drawer shells. Depressions on the top of the shells and complementary projections on the bottom of the shells permit them to be stacked and interfitted in a vertical position.

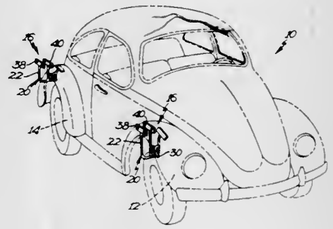
3,580,440
AUXILIARY CHUTE HOLD-DOWN MEANS FOR A TRUCK MOUNTED CONCRETE MIXER
William H. Fry, and Lawrence G. Zerba, Independence, Iowa, assignors to Construction Machinery Company, Waterloo, Iowa
Filed Feb. 13, 1969, Ser. No. 799,044
Int. Cl. B60r *11/06;* **B60p** *3/16*
U.S. Cl. 224—42.31 **11 Claims**

An auxiliary chute holddown means for a truck mounted concrete mixer including a pair of spaced apart support brackets secured to the mixer truck at one side thereof. The brackets are adapted to removably receive the auxiliary chute thereon and are adapted to support the chute in such a position so that one of its side edges is disposed laterally of and above its other side edge. An elongated flexible chain member is secured at one end to the truck between the brackets and has a movable cam lock means secured to its other end which is adapted to engage the uppermost chute



side edge. The brackets include lip portions which extend over the other chute side edge to assist in maintaining the chute on the brackets. The cam lock means is movable from an unlocked position with respect to the chute wherein the flexible member is substantially tension free to a locked position with respect to the chute wherein the flexible member is under tension to maintain the chute on the brackets.

3,580,441
CLAMPLESS FENDER MOUNTED BRACKET
Richard C. Zercher, Box 130A, R.D. 02, Lititz, Pa.
Filed Apr. 30, 1969, Ser. No. 820,487
Int. Cl. B60r *9/00*
U.S. Cl. 224—42.31 **3 Claims**

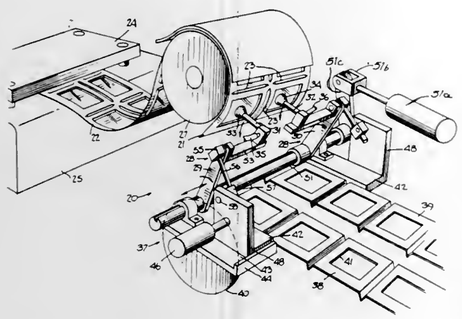


A cargo-carrying bracket adapted to be attached to a fender without clamps includes a load-bearing member adapted to be received in an inwardly directed channel on the edge of the fender, a load-supporting element extending from the load-bearing element, and a counterbalancing brace extending from the load-bearing element and adapted to engage the inner surface of the fender to balance a load applied to the load-supporting element.

3,580,442
METHOD AND APPARATUS FOR TRANSFERRING ARTICLES AND THE LIKE
Howard A. Rohdin, Waquoit, Mass., and Fred P. Brown, Jr., Centerville, Mass., assignors to Packaging Industries, Inc., Hyannis, Mass.
Filed Apr. 4, 1968, Ser. No. 718,732
Int. Cl. B26f *3/02*
U.S. Cl. 225—2 **32 Claims**

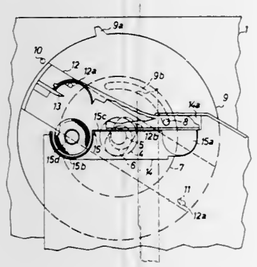
The method and apparatus of the disclosure relate to the transfer of articles that are formed in a predetermined array at a fixed center-to-center relationship to form another predetermined array of articles which have a center-to-center relationship different from the first predetermined array. The apparatus includes at least one transfer arm, that is equipped

with a suction cup for pulling an individual article from its position in the first predetermined array, and for holding the



article while it is transferred from that position to a position in the second predetermined array.

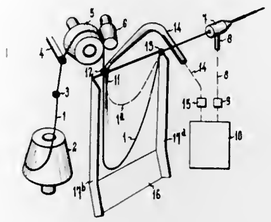
3,580,443
APPARATUS FOR OPENING FILM CASSETTES
Fridolin Hennig; Hans-Jurgen Kellner; Klaus Potz, and Christian Gotze, Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Jan. 21, 1969, Ser. No. 792,288
Claims priority, application Germany, Jan. 19, 1968, Sept. 14, 1968, P 16 22 303.3 and P 17 97 336.3
Int. Cl. B26f *3/00*
U.S. Cl. 225—96.5 **22 Claims**



Apparatus for opening plastic housings of film cassettes comprises a support which can hold a housing in a predetermined position, a tool having a cutting edge which is movable against and penetrates into the housing to produce therein a crack, and means for thereupon moving the tool with reference to the housing or vice versa so that the crack is propagated until the housing is sufficiently opened to permit evacuation of the reel which carries exposed film.

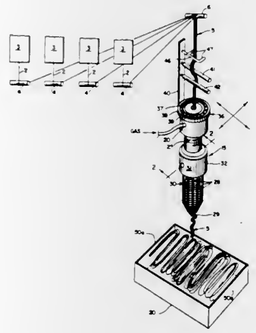
3,580,444
DEVICE FOR LOCALIZING AN EXCESS IN LENGTH IN A THREAD
Hubert P. Van Mullekom, Deurne, North Brabant, Netherlands, assignor to N. V. Machinefabriek L. Te Strake, Deurne, Netherlands
Filed Aug. 26, 1968, Ser. No. 755,260
Claims priority, application Netherlands, Sept. 4, 1967, 6712130
Int. Cl. B65h *17/32*
U.S. Cl. 226—97 **3 Claims**

This device, which is adapted to be interposed between a device for continuously supplying a thread and a device for intermittently conveying the thread, comprises first and second thread-guiding elements, between which is a space in which an excess in length in the thread can hang down from such elements in the form of a loop. A downward-directed nozzle is arranged adjacent to the first thread-guiding element, through which thread enters the loop, for discharging



fluid downward along the descending leg of the loop in order to place the descending leg under tension so as to prevent the loop from tangling. The ascending leg of the loop is relatively free of tension.

3,580,445
GUIDING APPARATUS FOR ELIMINATING ENTANGLEMENT AND TWIST IN PUDDLED MULTIFILAMENT YARN
Robert B. Moore, Jr., Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed June 16, 1969, Ser. No. 833,422
Int. Cl. B65h *17/32*
U.S. Cl. 226—97 **2 Claims**

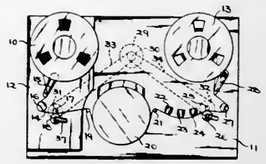


A guiding apparatus for eliminating filament entanglement and twist in a multifilament ribbon of yarn puddled by a gas-operated puddling jet. The apparatus is revolvably mounted on the inlet end of a puddling jet and provides a snubbing action on the yarn whereby the adverse effect produced by the twisting vortex of the jet may be minimized.

3,580,446
MAGNETIC TAPE MOVEMENT-INITIATION SYSTEM
Yoshiyo Wada; Katsuya Yasutake, Yokohama, and Yoshikazu Terao, Tokyo, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan
Filed Aug. 14, 1969, Ser. No. 850,130
Claims priority, application Japan, Aug. 16, 1968, 43/58,027
Int. Cl. G11b *15/43*
U.S. Cl. 226—108 **10 Claims**

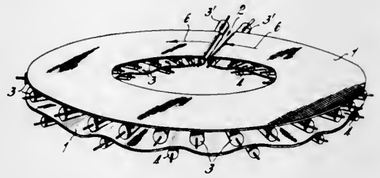
A magnetic tape movement-initiation system which causes two magnetic tape drive means to operate such that one means is actuated with a time lag with respect to the other means. Said two magnetic tape drive means are mounted in the path of travel of a magnetic tape paid out from a supply

reel and wound on a takeup reel such that one means is disposed on the supply reel side and the other means is



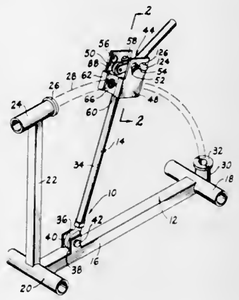
disposed on the takeup reel side with respect to magnetic heads which are brought into contact with the magnetic tape.

3,580,447
TEXTILE TREATING APPARATUS
Eduard Kusters, and Max Kruger, Krefeld, Germany, assignors to Eduard Kusters Maschinenfabrik, Krefeld, Germany
Continuation-in-part of application Ser. No. 729,748, May 16, 1968, now abandoned , Continuation-in-part of application Ser. No. 729,748, May 16, 1968, now abandoned. This application May 22, 1969, Ser. No. 826,990
Int. Cl. B65h *17/42*
U.S. Cl. 226—119 **17 Claims**



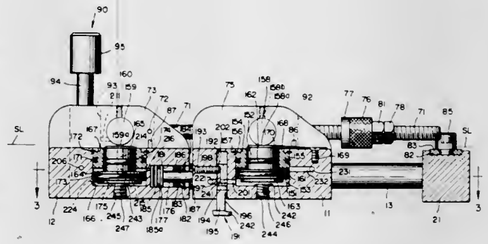
This disclosure relates to a textile-treating apparatus wherein the textile is conveyed through a chamber and appropriately treated therein. The textile is conveyed along a circular path within the chamber and in one embodiment includes an endless conveying means arranged to form a screw thread surface upon which the textile is moved through the chamber. Alternatively, the textile may be conveyed along a grid surface by means of an oscillating movement thereof, again in a circular path.

3,580,448
CABLE FEED DEVICE
Buddy L. Cagle, Sr., 3326 E. 27th Place, Tulsa, Okla.
Filed Feb. 19, 1969, Ser. No. 800,608
Int. Cl. B65h *17/36*
U.S. Cl. 226—127 **6 Claims**



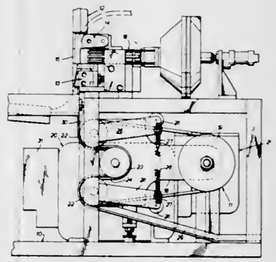
A cable feed device for facilitating longitudinal movement of a cable into a bore whereby a gripping device is mounted on a pivotal lever for grasping a portion of the cable and easily pulling or pushing the cable in the desired direction. The gripping device comprises a split block member having one portion thereof movable for facilitating alternate gripping and releasing of the cable in order to permit a repetitious pivoting of the device for a substantially continuous pulling or pushing of the cable.

3,580,449
STOCK FEED APPARATUS
Michael J. Chaban, Jr., Wilbraham, Mass., assignor to Standard International Corporation, Andover, Mass.
Filed Oct. 11, 1968, Ser. No. 766,757
Int. Cl. B65h *17/36*
U.S. Cl. 226—150 **13 Claims**



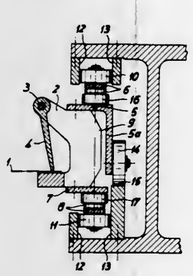
Stock-feeding apparatus of the intermittent reciprocating type having a simplified four-way valve for positive control of the sequencing of the apparatus. Particular features include a pressure-operated momentum-absorbing device and a practical simplified stock-release means.

3,580,450
GRIPPING MEANS FOR BINDING MATERIALS
Derick A. Sparks, Woodley, near Reading, England, assignor to Power Industries Limited, Maidenhead, England
Filed Aug. 16, 1968, Ser. No. 753,240
Int. Cl. B65h *17/24*
U.S. Cl. 226—171 **2 Claims**



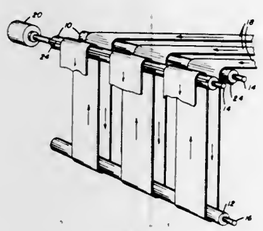
In a package-binding machine, a feed-drive device comprises an endless belt arranged to run on a plurality of pulleys or rollers, and guide means to pass binding material in running engagement between the belt and the surface of one of the pulleys or rollers, whereby a tension applied to the belt acts to grip binding material between the belt and the pulley or roller, and operation of drive means causes lengthwise feeding movement of the binding material.

3,580,451
CLAMP BLOCK CHAIN FOR HOLDING ONE EDGE OF A WEB OF MATERIAL
Raimund Fraitzl, Tengling, Upper Bavaria, Germany, assignor to Bruckner-Maschinenbau Gernot Bruckner, Tittmong, Upper Bavaria, Germany
Filed Sept. 18, 1969, Ser. No. 859,027
Claims priority, application Germany, Oct. 8, 1968, G6801212.4
Int. Cl. B65h *17/34*
U.S. Cl. 226—173 **4 Claims**



A clamp block chain comprises a series of clamp blocks, interconnected to form a chain, for holding one edge of a web of material. A series of upper rollers and a series of lower rollers are mounted on the chain to rotate on vertical axes. The upper rollers run between an upper pair of vertical guides, and the lower rollers run between a lower pair of vertical guides. A series of supporting rollers, mounted on the chain, rotate on horizontal axes, and there is a horizontal rail on which the supporting rollers run.

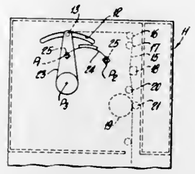
3,580,452
WEB TRANSPORT APPARATUS
Thomas A. Chuhta, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 15, 1969, Ser. No. 791,375
Int. Cl. B65h *17/20*
U.S. Cl. 226—191 **10 Claims**



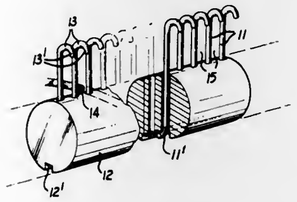
Web transport apparatus utilizing web transport rollers having a longitudinal rib on the web-contacting surface. The rib is formed of a spongy material whereby a plurality of webs having slippery surfaces may be transported simultaneously in parallel paths with good tracking characteristics.

3,580,453
TENSION ARM
Robert E. Schoeneman, East Setauket, N.Y., assignor to Potter Instrument Company, Inc., Plainview, N.Y.
Filed Oct. 8, 1969, Ser. No. 864,811
Int. Cl. B65h *23/10*
U.S. Cl. 226—195 **1 Claim**

An improved magnetic tape transport has a pivoted tension arm to which is attached a constant-tension flexure spring that is attached to the arm and the chassis so that a line through the points of attachment and the tape path are substantially parallel, thus maintaining a constant tape tension for all positions of the arm.



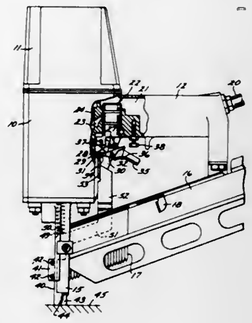
3,580,454
YARN GUIDE
Raymond Victor Evans, Blackburn, England, assignor to Singer-Cobble Limited, Blackburn, England
Filed Jan. 9, 1969, Ser. No. 790,034
Claims priority, application Great Britain, Jan. 9, 1968, Aug. 8, 1968, 1354/68;37831/68
Int. Cl. B65h *57/16*
U.S. Cl. 226—198 **8 Claims**



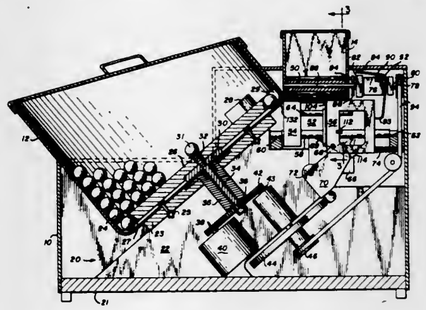
A yarn guide comprises two or more closely spaced guide elements which define yarn-receiving pockets between successive such elements, the pockets being limited at the one end by a body part on which the elements are mounted and at the other side by a displaceable retention member. The retention member will usually be formed integrally with the related guide element and will be such as to be displaceable by a yarn moving transversely of its length into engagement with the pocket but relatively nondisplaceable by a yarn moving transversely of its length and outwardly of the pocket. The guide elements may be elongated in the direction of the yarns to be separated thereby to form plates between adjacent such yarns or they may take the form of pinlike members having not substantial length in the yarn direction.

3,580,455
FASTENER DRIVING DEVICE OPERATING MEANS
Adolf Cast, Oberlenningen, and Heinz Schwarz, Zizishausen, Germany, assignors to Karl M. Reich Maschinenfabrik, Nurtingen, Germany
Filed Mar. 21, 1969, Ser. No. 809,064
Int. Cl. B27f *7/14*
U.S. Cl. 227—8 **23 Claims**

A powered fastener driving device having a power control means for selectively supplying power to a driver blade which drives fasteners out of the device, which power control means includes a member movable between a first position where no power is supplied to the driver blade and a second position where power is supplied to cause the driver blade in the device to drive a fastener, said control means including a counterreturn chamber therein which prevents said movable member from returning from said second position until after a predetermined lapse of time after the member is moved to said second position from said first position, and a crossmember pivotally mounted at its midpoint on said movable member and arranged with a manually operated trigger and a slidable workpiece touch-member which extends slightly beyond the front end of the nose piece of the device to cause the movable member to said second position when the trigger is pulled and the touch-member is moved rearwardly by engaging said device nose piece to the workpiece.



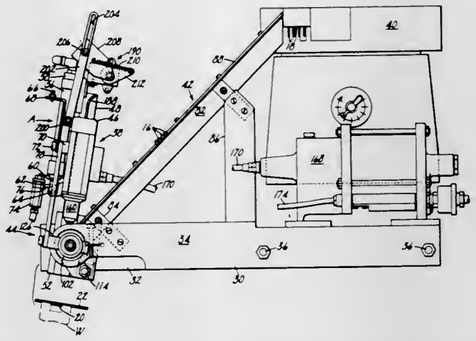
3,580,456
APPARATUS FOR INSERTING STICKLIKE OBJECTS INTO COMESTIBLE ARTICLES
Karl J. Zueger, 9 Shon Cr., Novato, Calif., and Eugene J. Decker, 514 Flagg St., San Jose, Calif.
Filed Oct. 9, 1969, Ser. No. 865,080
Int. Cl. B27f *7/02*
U.S. Cl. 227—100 **20 Claims**



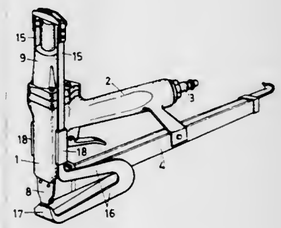
Apparatus for inserting toothpicks, or the like, into comestible articles such as hors d'oeuvres, diced cheeses or meats, bar fruits and similar articles including a suitable conveyor means for individually positioning the articles to be impaled relative to an impaling means, a container for storing the toothpicks or other objects with which the comestibles are to be impaled and impaling means operatively coupled to the conveyor means for retracting one or more of the impaling objects from the container and causing it to be driven into a comestible article to form the desired food preparation.

3,580,457
FASTENER INSERTING MACHINES
James N. Henshaw, Birmingham, Mich., assignor to USM Corporation, Flemington, N.J.
Filed May 15, 1969, Ser. No. 824,946
Claims priority, application Great Britain, June 26, 1968, 30358/68
Int. Cl. B21j *15/10*
U.S. Cl. 227—116 **9 Claims**

A machine for successively installing fasteners, especially the pull-to-set-type blind rivet-mandrel assemblies, wherein the fasteners are fed uniformly oriented in a vertical plane from a source of supply to a pickoff locality. An installing head is reciprocable in a parallel plane between a fastener inserting locality and a retracted fastener receiving position, and a transfer device is operative between the pickoff locality and the receiving position successively to reorient and present the fasteners for insertion by the head in a work piece or work pieces.



3,580,458
COMPRESSED AIR STAPLING MACHINE FOR METALLIC STAPLES WITH CONTROL OF THE ANVIL FOR BENDING THE STAPLE ENDS
Umberto Monacelli, Via del Parco, Biassono (Milan), Italy
Filed July 14, 1969, Ser. No. 841,216
Claims priority, application Italy, July 19, 1968, 19,179
Int. Cl. B25c *5/02*
U.S. Cl. 227—124 **5 Claims**

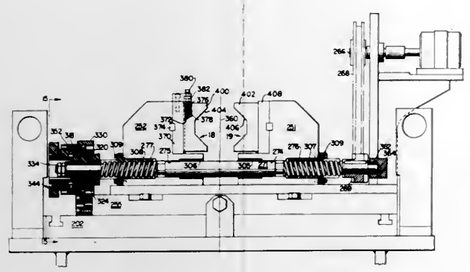


A compressed air stapling machine for metal staples provided with an anvil for bending the fixed staples ends and means for controlling said anvil.

3,580,459
VARIABLE POSITION MEANS FOR HOLDING A NONROTATING WORKPIECE IN FRICTION WELDING APPARATUS
Arthur F. Gage, Warren, and Alex F. Stamm, Rochester, Mich., assignors to Rockwell-Standard Company, Pittsburgh, Pa.
Filed Oct. 23, 1968, Ser. No. 769,964
Int. Cl. B23k *27/00*
U.S. Cl. 228—2 **14 Claims**

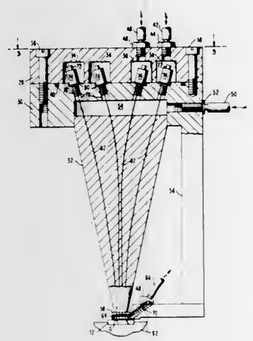
Friction welding apparatus including a pair of members having transversely facing workpiece engaging surfaces thereon for holding a nonrotating workpiece and adjusting means for varying the positions of the members relative to each other and a machine support. The adjusting means includes transverse adjusting means for selectively and inde-

pendently moving the members toward or away from each other along an axis transverse to the normal welding axis and



for selectively and independently moving the members as a unit in either direction along the transverse axis.

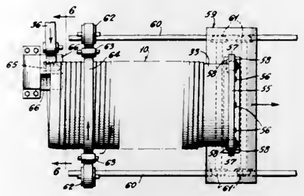
3,580,460
THERMOCOMPRESSION BONDING APPARATUS
Lewis D. Lipschutz, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed July 26, 1968, Ser. No. 747,940
Int. Cl. B23k *1/00, 37/04*
U.S. Cl. 228—4 **6 Claims**



A thermocompression bonding apparatus having a plurality of slidably disposed, independently operable impact surfaces. A plurality of pistons are slidably disposed in a housing, and each include extension means terminating in respective impact surfaces. The pistons are actuated so as to urge the impact surfaces into an impact zone so as to affect a plurality of thermocompression bonds.

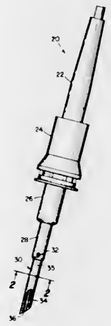
3,580,461
METHOD AND APPARATUS FOR MAKING ELONGATED VESSELS, CONTAINERS AND TUBULAR MEMBERS
Curzon Dobell, Nassau, Bahamas, and Leslie P. Wilson, London, England, assignors to Caribbean Holdings Ltd., Nassau, Bahamas
Division of Ser. No. 341,835, Jan. 24, 1964, Pat. No. 3,425,118, Feb. 4, 1969. This application June 6, 1968, Ser. No. 753,316
Int. Cl. B23k *1/20*
U.S. Cl. 228—15 **17 Claims**

Method and apparatus for forming elongated hollow pressure-resistant cylindrical articles from a continuous strip of prestressed and pretensioned material wherein the strip of material is laid down in a plurality of helical windings which may overlap or abut each other by the application of a rotative force; the windings are sealably bonded as laid down; and the forming cylindrical article is displaced axially by a force separate from the rotative force to lay down the windings until the desired length of article is formed. The apparatus embodies fixed arcuate segments or rotatable cylindrical forming heads to shape the cylindrical articles from the strip; driven endless belt assemblies to rotate the forming ar-



ticle; and mechanical drives synchronized with the driven belt to axially move the forming article or pressurized fluid supplied interiorly of the forming article to axially displace the forming article under a controlled advance by mechanical linkages synchronized with the driven belt assembly.

3,580,462
SOLDERING APPARATUS
Louis Vanyi, 246 Crestwood Ave., Ventura, Calif.
Filed Dec. 14, 1967, Ser. No. 690,590
Int. Cl. B23k *3/02*
U.S. Cl. 228—51 **16 Claims**



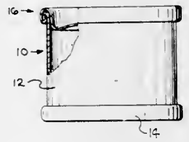
A soldering iron tip and method of soldering wherein the amount of solder applied is closely controlled and excess solder is automatically removed. It employs an elongate heated applicator with a solder reservoir area, said heated applicator having a plurality of small apertures on its work contacting face each leading to the reservoir area. In one embodiment the tip is made up of a bundle of rigid rods encased in a sleeve, the rods terminating substantially even with the end of the sleeve and the tip end being shaped to contact the work. It employs capillary attraction to apply solder and to draw excess solder off of a workpiece and into the reservoir area. When the reservoir is full of brief shake will dislodge accumulated solder from the reservoir and clear it for future use.

3,580,463
PACKAGE FOR SOLID PIECES OF FOODSTUFFS OR THE LIKE AND METHOD FOR MANUFACTURING SUCH PACKAGES
Steven Duerink, 14, Mussenstraat, Uden, and Leendert Steinvoort, 9, Prof. Regoutstraat, Best, Netherlands
Filed Mar. 19, 1969, Ser. No. 808,436
Claims priority, application Netherlands, Mar. 20, 1968, 68 03956
Int. Cl. B65d *1/00, 85/00*
U.S. Cl. 229—2.5 **11 Claims**

A package characterized in that it has a substantially rectangular bottom having only at two opposite ends an upstanding wall part, said wall parts having along their outer periphery in the zones where these wall parts are not connected to the bottom part, a flange, the generating lines of which flanges are parallel to the main surface of the bottom part and that to the flanges of the upstanding wall parts a separate closing cover of a sheet of easily printable material such as hard paper or thin white cardboard is applied which

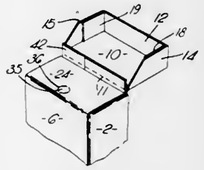
extends along the entire periphery of the upstanding wall parts with the exception of the bottom part and has generating lines also parallel to the bottom part. This makes it possible to use a simple closing cover from a flat sheet, for instance of paper or thin white cardboard, which can easily be printed and given an attractive appearance and the foodstuffs can be displayed for sale in the package in such a way that substantially only the closing cover is visible.

3,580,464
HERMETICALLY SEALED COMPOSITE CONTAINER
Edwin D. Griffith, Pemberville, Ohio, assignor to Owens-Illinois, Inc.
Filed Mar. 17, 1969, Ser. No. 807,601
Int. Cl. B65d *3/10, 5/02*
U.S. Cl. 229—5.6 **4 Claims**



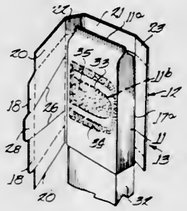
An improved hermetically sealed composite container formed by double seaming a pair of heated and compounded metal ends to a flanged can body so that the heated compound is bonded to an inner liner of thermoplastic material on the can body to provide an effective seal.

3,580,465
CARTONS
Kenneth Knapton Davies, Chorleywood, England, assignor to The Metal Box Company Limited, London, England
Filed Sept. 25, 1968, Ser. No. 762,598
Claims priority, application Great Britain, Sept. 29, 1967, 44528/67
Int. Cl. B65d
U.S. Cl. 229—14 **6 Claims**



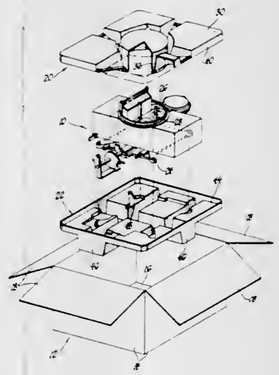
A carton having a lid hinged to the rear wall and arranged to cover the mouth and parts of the front and sidewalls of the carton is provided with an internal tubular liner an end portion of which is bellows folded and overlies a closure panel infolded from the top of the front wall of the carton, and the top of the lid, when closed, overlies the bellows folded portion of the liner and the closure panel and lies in a plane substantially at right angles to the sides of the body.

3,580,466
SANITARY PACKAGE
Edmund J. Thelen, Deerfield, and Robert H. King, Evanston, Ill., assignors to Packaging Corporation of America, Evanston, Ill.
Filed Jan. 31, 1969, Ser. No. 795,647
Int. Cl. B65d *5/56, 17/00*
U.S. Cl. 229—14 **5 Claims**



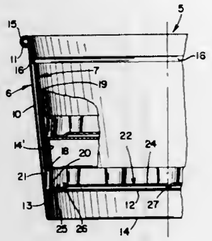
A sanitary package is provided with a reclosable cover to facilitate dispensing of a product therefrom. The package includes a foldable outer carton having a reclosable cover defined on the top panel thereof and a sealed product-accommodating bag disposed within the carton and affixed thereto.

3,580,467
CARBURETOR PACKAGE
Franklin B. Pieszak, Grosse Pointe Woods, and Marvin G. Knaggs, Livonia, Mich., assignors to Carroll Plastics Corporation, Detroit, Mich.
Filed May 21, 1969, Ser. No. 826,318
Int. Cl. B65d *5/58, 81/06, 85/30*
U.S. Cl. 229—14 **15 Claims**



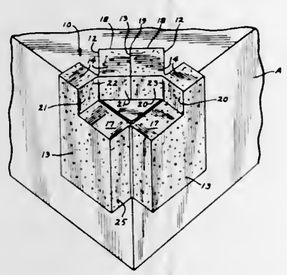
A packaging assembly for carburetors including a cardboard container, a preformed plastic bottom insert to receive and support the carburetor relative to the container and a preformed plastic top insert having a deep annular depression terminating in an annular surface which engages the carburetor air cleaner seat to seal the carburetor and restrain it within the container.

3,580,468
NESTABLE DOUBLE-WALLED DISPOSABLE CONTAINER
James A. McDevitt, Kalamazoo, Mich., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Aug. 5, 1969, Ser. No. 847,561
Int. Cl. B65d *15/02, 3/22*
U.S. Cl. 229—14 **5 Claims**



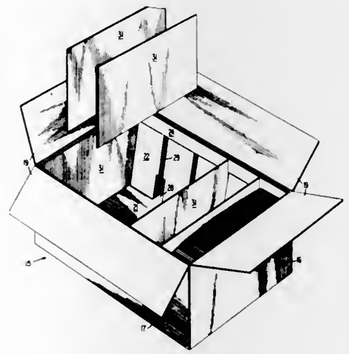
Composite frustoconical nestable, double-walled, disposable (i.e. inexpensive) containers (cups in the smaller sizes, tubs in the larger sizes) are formed by combining conventional outer paper cups and inner liner cups formed of thin-walled thermoformed seamless plastic. The outer paper cups have plain or straight (i.e. uninterrupted) sidewalls from top to bottom with outwardly curled rims or lips at the top and recessed bottoms resulting in a continuous rim at the bottom of each cup. The plastic inner liner cups also have frustoconical sidewalls which are somewhat smaller than the sidewalls of the outer paper cups so as to leave in each cup a space between the interfitting sidewalls. Each inner liner has a rim or lip at the top which is curled over, around and under the rim of the outer paper cup so as to snugly embrace the same. A short distance below the rim each plastic inner liner has a continuous, inwardly opening, circumferential lid-receiving groove, the outer periphery of which engages the surrounding inner surface of the sidewall of the outer paper cup so as to act as a spacer between the sidewalls. Adjacent the bottom of each inner liner cup there is a series of circumferentially spaced stacking indentations integrally formed partially in the lower sidewall and partially in the bottom of the liner cup. The segments of the sidewall intermediate the stacking indentations flare outwardly in respect to the frustoconical sidewall so as to join the liner bottom in circumferentially spaced arcuate corners which rest and engage in the continuous circumferential inner corner formed between the bottom and sidewall of the outer paper cup. The stacking indentations have generally horizontal top shelves or shoulders which are engaged by the bottom rims of the outer paper cups when the composite containers are in nested condition.

3,580,469
CORNER PAD
Larrie S. Reese, Mahtomedia, Minn., assignor to Logistics Industries Corporation, Philadelphia, Pa.
Filed Sept. 8, 1969, Ser. No. 855,811
Int. Cl. B65d *5/62, 25/26*
U.S. Cl. 229—14 **10 Claims**



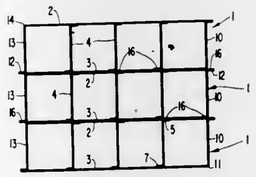
A corner pad for use in packaging fragile articles. The pad is formed from yieldable material and formed in a blank of solid rectangular configuration. It can be conveniently shipped and stored in this form. Immediately prior to use the blank is "popped" or setup for placement into engagement with the corner of the fragile article.

3,580,470
CONTAINER FOR PACKING BAGS
Edwin Clifton Leonard, Richmond, Va., assignor to Eskimo Pie Corporation, Richmond, Va.
Filed May 23, 1968, Ser. No. 731,507
Int. Cl. B65d *3/24, 5/48*
U.S. Cl. 229—15 **11 Claims**



The present invention involves a method of packaging flat bags for shipment and a shipping container for the bags. The bags have a folded bottom end which is substantially thicker than the open top end. In the disclosed method a number of bags are arranged flatwise into an elongated bundle with the thicker bottom ends of the bags at the top so that the longitudinal cross section of the bundle is a wedge shape that is narrower at the bottom, the bundles are arranged side-by-side in rows and inwardly directed forces are maintained on the supporting end surfaces of each row as well as against the sides of each row. The shipping container comprises an outer casing having end, side and bottom walls in which is inserted a packing insert having a pair of inclined wedging panels that extend between the casing end walls and are inclined outwardly and upwardly from a location on the casing bottom wall spaced inwardly from the bottom of the casing sidewalls. The upper portion of the wedging panels contact the upper portion of the casing sidewalls to form a wedgelike compartment for containing rows of bags stacked in fanlike bundles and locking tabs extend between the lower portion of the inclined wedging panels and the casing sidewalls.

3,580,471
COLLAPSIBLE CELLULAR BOX PARTITIONS
William R. Burke, and Frank S. McCall, Savannah, Ga., assignors to Union Camp Corporation, New York, N.Y.
Filed June 24, 1968, Ser. No. 739,300
Int. Cl. B65d *5/48, 85/00*
U.S. Cl. 229—15 **1 Claim**

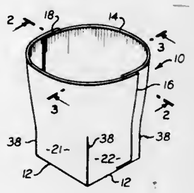


A collapsible cellular partition unit is formed by spacing parallel sheets and locating therebetween parallel, longitudinally extending wall sheets, each wall sheet having one longitudinal edge secured to one spaced sheet and the other edge secured to the other spaced sheet. For the continuous manufacture of such units, the spaced sheets are formed by two moving webs to which longitudinal glue lines are applied. The wall sheets are formed by webs moving between and with the first webs. The wall sheet webs are slit from a single stock roll and are scored to form longitudinal flaps to adhere to the glue lines on the respective first two webs. The first two webs are scored to form the outer wall portions of the partition unit. A partition structure of desired size may be built up by assembling the required number of partition units, the units being secured to each other by glue areas on their spaced sheets. The partition structure may then be secured in a collapsed position within a collapsed container and both shipped as an integrated package unit for simultaneous setup.

3,580,472
SWAB DISPENSER FOR PACKAGE THEREFOR
Theodore H. Stawski, Union, N.Y., assignor to Becton, Dickinson and Company, Rutherford, N.J.
Filed June 10, 1969, Ser. No. 831,929
Int. Cl. B65d *5/72*
U.S. Cl. 229—17 **6 Claims**

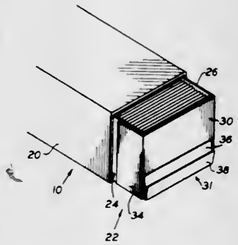
A portable dispensing apparatus for dispensing a sterile unpackaged medical swab and a moisturizing charge of a liquid medium. A package member for storing the swab as one of a plurality of stacked swabs. The package, received and supported by the apparatus, having bottom supporting structure for the swabs and both a rear cutout to allow passage of a pivotal dispensing lever and a front exit to dispense, upon lever movement, the swab from the package and from an aligned dispensing slot in the apparatus.

3,580,473
PAPER BOARD CONTAINER WITH PLATFORM STYLE BOTTOM
Lester D. Gill, 302 North Road, Kinnelon, N.J.
Filed Feb. 6, 1969, Ser. No. 797,111
Int. Cl. B65d *3/08*
U.S. Cl. 229—21 **16 Claims**



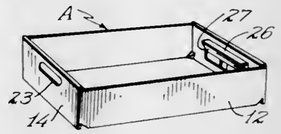
A merchandising container of paperboard or nonmetallic sheet material made from a blank that provides a platform bottom of polygonal shape and sidewalls that change to a top edge that is circular, oval, or at least more circular than the bottom. Panels fold back on themselves to hold the bottom at a level above the bottom of the sidewalls. The preferred shape of the bottom is square and this makes a particularly effective blank that can be supplied flat and set up on a filling machine at a user's factory. A laminate blank can provide a moisture and vaporproof container.

3,580,474
CONTAINER-MAGAZINE FOR DISPENSING LABELS
Emile L. Provost, New York, and Antonio Tomasello, Yonkers, N.Y., assignors to Gellman Industries, Inc., New York, N.Y.
Filed Aug. 5, 1968, Ser. No. 750,345
Int. Cl. B65d *5/38, 5/72*
U.S. Cl. 229—20 **5 Claims**



An elongated unitary container-magazine for dispensing folded labels having at least one flap, and a nonunitary container-magazine comprising an outer box and an inner box for the same purpose. The invention also includes patterns for forming the foregoing container-magazines.

3,580,475
STACKING TRAYS
Odess V. Mobley, Birmingham, Ala., assignor to Hoerner Waldorf Corporation, Ramsey County, Minn.
Filed Oct. 14, 1969, Ser. No. 866,210
Int. Cl. B65d *5/22*
U.S. Cl. 229—34 **8 Claims**

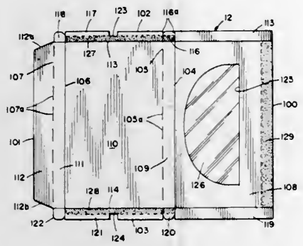


A paperboard tray is provided which has opposed end walls including an outer end wall panel, corner flaps hinged to the sidewalls, and an end wall liner panel. The end wall liner panels are provided with a pair of hingedly connected flanges, one of which is hinged to the liner panel and extends on a horizontal plane, and the other of which engages an abutment on the corner flaps to support the first flange. The bottom of one tray is adapted to rest on the horizontal flanges of a similar tray for stacking purposes.

3,580,476
CARTON FOR USE WITH PACKAGING APPARATUS
Lester E. Cannon, Chicago Heights; John M. Tindall, Wilmette, and Howard N. Taylor, Chicago Heights, all of, Ill., assignors to Folding Cartons, Inc., Melrose Park, Ill.
Continuation-in-part of application Ser. No. 685,140, Nov. 22, 1967, now Patent No. 3,474,594. This application Oct. 23, 1969, Ser. No. 868,738
Int. Cl. B65d *5/02*
U.S. Cl. 229—37 **6 Claims**

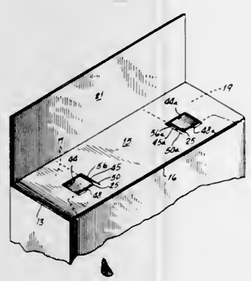
A carton for use with packaging apparatus for packaging food products and the like. The carton is formed of flexible board material and includes rectangular top, bottom, and sidewalls, the end portions of which are provided with fold

lines defining top, bottom, and side flaps. The fold line between the bottom wall and one of the sidewalls is provided with spaced-apart cut slots therealong to facilitate the folding of the carton. Each of the bottom flaps is provided with a rectangular notch extending inwardly from the free edge of



the flap at about the middle of the length thereof for accommodating a mechanical lifting element on the packaging apparatus. The side flaps are generally rectangular, and the grain of the board material extends generally parallel with the free edge of the bottom flap.

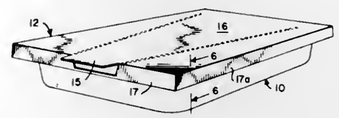
3,580,477
RECTANGULAR CARTON HAVING SIFT-PROOF AND SQUARING CLOSURE
Albert L. Roth, 11 Bradley Court, Spring Valley, N.Y.
Filed Mar. 17, 1969, Ser. No. 807,556
Int. Cl. B65d *5/10*
U.S. Cl. 229—39 **7 Claims**



The invention provides an improved carton for powdered materials and the like, of rectangular or square shape, which has a top or bottom closure of inwardly foldable flaps, and preferably both, wherein the inwardly foldable flap on the rear wall of the carton is provided with two cutout portions each having a side edge which is engaged by a tongue provided on the sidewall flap so as to maintain the carton in squared condition; and at the same time such cutouts each have an oblique angled portion which permits one of said tongues to be interlocked therewith, so that the extension members on the rear wall and sidewalls may be readily glued or sealed to the flap on the front wall of the carton to provide a squared and sealed carton ready for shipping, stacking and display purposes.

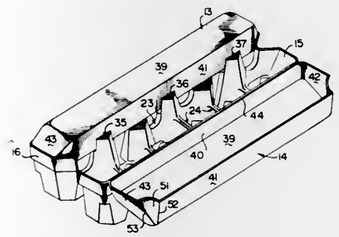
3,580,478
PACKAGING
Robert P. Bemiss, Hillsborough, Calif., assignor to Alexander Donald, San Francisco, Calif., a part interest
Filed July 24, 1969, Ser. No. 844,494
Int. Cl. B65d *5/64, 43/00*
U.S. Cl. 229—43 **12 Claims**

The carton and package provides for a new type of closure which may take several different forms, each of which incorporates a coated paperboard lid having a heat-sealable plastic coating such as polyethylene for example. Wherein a 180° bend is made to provide an outer edge of the lid which is heat-sealed together to provide strength to support a divergent flange or edge which is used in accomplishing a closing and/or sealing of the carton or package. In one form, this edge provides a snap-on operation for mechanically securing the lid on a tray by an interlocking relation between the horizontal flange on the top of the tray and the lid.



In another form of the invention, to provide the mechanical securing the edge of the lid is heat-sealed to the underside of the lip of the tray while the body of the paperboard lid is being heat-sealed on the top side of the lip of the tray. In both instances, an adhesive seal is used in addition to the heat seal which melts at temperatures below 212° F. and preferably at about 170°—180° F.

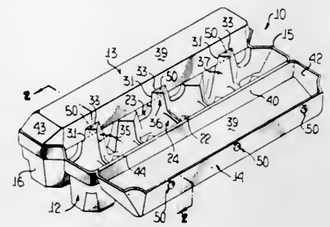
3,580,479
MOLDED PULP EGG CARTON
Arthur J. Weiss, Bergenfield, N.J., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Aug. 29, 1966, Ser. No. 576,511
Int. Cl. B65d *5/66, 1/00*
U.S. Cl. 229—44 **9 Claims**



This disclosure relates to an egg carton or the like formed of a plurality of transverse pairs of pockets for receiving eggs, and a pair of covers for closing a body of the carton. Adjacent end panels of the covers are provided with concave, triangular recesses for facilitating the introduction of a person's fingers between the covers to readily open the same. The carton is preferably of a molded pulp construction, and bottom walls of at least selected ones of the pairs of compartments are rigidified by a wall bridging a longitudinal centerline of the carton while other transverse pairs are spaced from one another by a gap across the centerline.

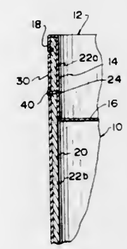
3,580,480
LOCK FOR EGG CARTON COVER
Richard P. French, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.
Filed Jan. 19, 1968, Ser. No. 699,086
Int. Cl. B65d *45/00, 1/00, 5/48*
U.S. Cl. 229—45 **7 Claims**

This invention is directed to an egg or similar type carton which includes a carton body and a pair of covers for opening and closing an end of the body opposite a bottom wall thereof. Each of the covers includes a pair of locking panels which are normally disposed in side-by-side relationship along a centerline of the carton body in a closed position of the covers. The locking panels are received in slots of upwardly directed posts, and bosses are formed from the material of the locking panels for engagement beneath as-



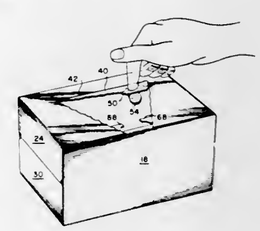
sociated edges of the slots to interlock the covers therewith in the closed position.

3,580,481
EASY OPENING ARRANGEMENT FOR RECLOSABLE CAN
Melvin A. Koboldt, St. Louis, Mo., assignor to Container Corporation of America, Chicago, Ill.
Filed Jan. 27, 1969, Ser. No. 794,114
Int. Cl. B65d *3/10, 17/06*
U.S. Cl. 229—51 **1 Claim**



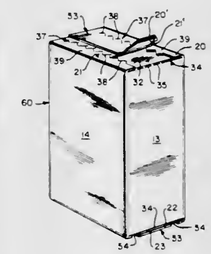
A reclosable fiber can having body wall sections separated by a cut, an outer label, a pull element between the label and body located over the cut, wherein said label is secured to the outer surface of the body except in the marginal areas on opposite sides of said cut.

3,580,482
LATCH FOR RECLOSABLE CARTON AND BLANK THEREFOR
Richard F. Witte, Henrico, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed Feb. 17, 1969, Ser. No. 799,760
Int. Cl. B65d *5/54, 17/00*
U.S. Cl. 229—51 **12 Claims**



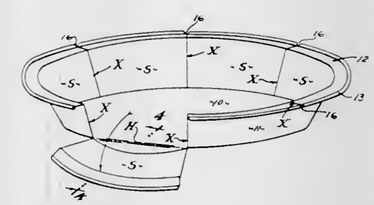
A latch for a reclosable carton construction and blank therefor wherein means are provided to engage a reclosable tab on a male locking member so as to resist its natural tendency to spring back when it is in its locked position. In the preferred form of the invention, the female locking member as well as the means to prevent spring back of the male locking member are each formed in a conventional glue line panel. The male and female locking members are so positioned and arranged in an overlapping relationship that the male locking member snaps into its locked position. A novel pushbutton-type unlatching member is provided integral with a male locking member to reopen the closed carton.

3,580,483
MEMBRANE SEALED CARTON
Chauncey Young, St. Louis, Mo., assignor to Riegel Paper Corporation, New York, N.Y.
Filed Feb. 20, 1969, Ser. No. 800,866
Int. Cl. B65d *5/54*
U.S. Cl. 229—51 **8 Claims**



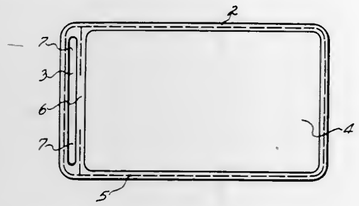
The disclosure relates to improvements in tear opening structures for end filled, end sealed cartons and, more specifically, to an improved opening structure for membrane sealed cartons of the type in which a separate "safety shield" material of polyethylene coated glassine or the like is heat sealed or otherwise tightly secured to the outfolded end flaps and side flaps of a carton prior to the infolding and adhering of at least a pair of said flaps to one another to complete the end structure.

3,580,484
PORTION ACCESS PIE PLATE
Michael S. Schneider, Los Angeles (5755 Cantelope Ave., Van Nuys, Calif.)
Filed Mar. 24, 1969, Ser. No. 809,573
Int. Cl. B65d *1/34, 17/02;* **A47j** *37/01*
U.S. Cl. 229—51 **4 Claims**



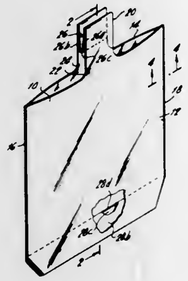
This invention relates to edible pies that are baked in plates and then cut into segmental portions and removed from the plate as individual servings, provision being made for gaining access to and to loosen each portion of pie in order to avoid mutilation thereto, and involving lines of weakening extending radially of the plate so as to define segments and specifically through the side and rim of the plate, whereby segmental sections of the side and rim are hinged and depressable for exposing cut portions of pie and for having a lever action that lifts and loosens the pie, thereby facilitating extraction of pie portions from the plate without mutilation.

3,580,485
CONTAINERS
Robert Leonard Hall, Streatham, London, England, assignor to Monsanto Chemicals Limited, London, England
Filed May 7, 1969, Ser. No. 822,482
Claims priority, application Great Britain, May 28, 1968, 23,848/69
Int. Cl. B65d *43/02*
U.S. Cl. 229—51R **3 Claims**



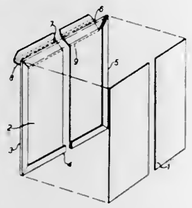
A packaging container which includes a flanged body sealed with a lid, the flange having an elongated depression formed therein which facilitates opening the container by pressing a portion of the lid into the depression to puncture it.

3,580,486
PLASTIC BAG WITH INTEGRAL HANDLE
Emanuel Kugler, 124 Richmond Ave., Lawrence, N.Y.
Filed Mar. 19, 1969, Ser. No. 808,581
Int. Cl. B65d *31/08, 33/10*
U.S. Cl. 229—54 **3 Claims**



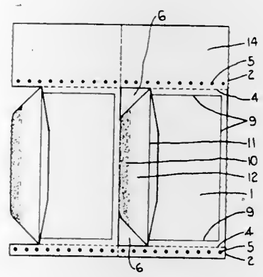
A plastic bag having an integral straplike handle at its upper end and having a bottom gusset or satchel bottom construction which unfolds under the weight of items carried in the bag into a three dimensional configuration.

3,580,487
GRAMOPHONE RECORD SLEEVES
Norman John Garrod, Bletchingley, Surrey, Great Britain
Filed Sept. 10, 1969, Ser. No. 856,682
Claims priority, application Great Britain, Jan. 8, 1969, 1200/69
Int. Cl. B65d *81/02*
U.S. Cl. 229—68 **11 Claims**



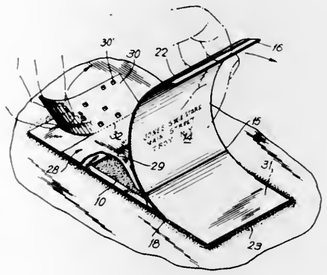
A gramophone record sleeve comprising two side members interconnected along three edges by spines, the fourth edge of the sleeve being closable by a closure flap integral with one side member and pivotal along a hinge line in the one side member parallel to but spaced inwardly of the fourth sleeve edge.

3,580,488
CONTINUOUS ENVELOPE
Stanley Komen, 348 Swanson Road, Sycamore, Ill.
Filed Jan. 2, 1968, Ser. No. 695,188
Int. Cl. B65d *27/10*
U.S. Cl. 229—69 **6 Claims**



A continuous envelope system in which a plurality of joined envelopes are made from a single web of sheet material, each of the envelopes has hinged joints at the three closed sides thereof so that full opening of the envelope is attained upon spreading of the front and back panels.

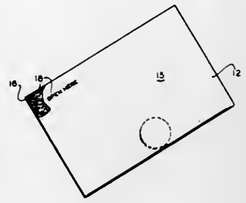
3,580,489
SHIPPING ENVELOPE
Joseph S. Oettinger, 21 Richwell Road, Scarsdale, N.Y.
Filed Aug. 1, 1969, Ser. No. 846,730
Int. Cl. B65d *27/02*
U.S. Cl. 229—70 **3 Claims**



A shipping envelope having a front and back panel, the latter having an aperture to expose a portion of the surface of a shipping ticket contained in the envelope so that the back of the envelope and the exposed surface of the shipping ticket can be adhesively secured to a container, the envelope having means whereby the front panel thereof can readily be stripped from the back panel to expose the shipping ticket, the latter having readily removable end portions carrying shipping indicia thereon.

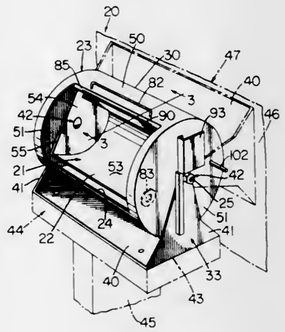
3,580,490
EASY OPENING FLAT OBJECT MAILER
Robert B. Shaad, Birch Lane, Watertown, N.Y.
Continuation-in-part of application Ser. No. 804,817, Mar. 6, 1969, now abandoned. This application Feb. 20, 1970, Ser. No. 13,149
Int. Cl. B65d *65/32, 3/26*
U.S. Cl. 229—92.9 **1 Claim**

A mailer for small flat objects, adapted for insertion in an envelope, comprises a rectangular cardboard blank having a scored median foldline dividing the blank into a pair of rectangular panels. One side of the blank is coated with an adhesive having the property of bonding the panels together when the blank is folded, the panels being readily pulled



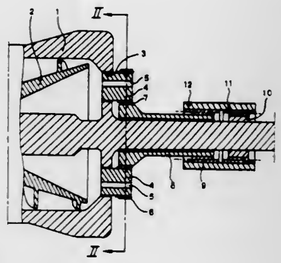
apart again. One corner of the blank is cut away along a convexly curved line leaving the corner of one of the folded panels projecting so that it may be pushed back exposing a small area of the under surface of the deformed corner for grasping the deformed corner for easy opening.

3,580,491
MAILBOX
Ray J. Campbell, R.R. 1, Ansonia, Ohio
Filed Aug. 23, 1968, Ser. No. 754,846
Int. Cl. A47g *29/12*
U.S. Cl. 232—35 **10 Claims**



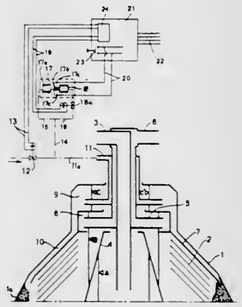
A mailbox of simple and economical construction is provided which is easy to open with one hand and is self-closing. The mailbox has a stationary inner container provided with a first opening therein and an outer member rotatably supported around the inner container and having a second opening provided therein and with the outer member having weight means thereon which is acted upon by gravity causing rotation of the outer member in one direction about the inner container until a portion of the outer member is aligned over the first opening with the second opening being angularly displaced from the first opening to define a closed position for the mailbox. The mailbox is easily opened by rotating the outer member in a direction opposite the one direction until the second opening is aligned over the first opening to provide unobstructed access to the interior of the inner container. The mailbox has a stop which limits rotation of the outer member in either direction and has a unique self-dropping signal flag which drops merely by opening the mailbox.

3,580,492
CENTRIFUGAL SEPARATOR WITH ADJUSTABLE OUTLET MEANS
Jan R. Schnittger, Saltsjobaden; Carl-Goran Nilson, Tulling, and Bengt D. R. Larsson, Tumba, all of, Sweden, assignors to Alfa-Laval AB, Tumba, Sweden
Filed Aug. 15, 1968, Ser. No. 752,860
Claims priority application Sweden, Aug. 23, 1967, 11779/67; 11780/67; 11781/67
Int. Cl. B04b *1/20*
U.S. Cl. 233—7 **13 Claims**



In a centrifugal separator of the kind having a conveyor screw arranged in the rotor for discharging sludge, or the like, separated from the liquid fed to the rotor, the overflow outlets for the liquid are movable between radially inner and outer positions while the rotor is in operation. For this purpose the overflow outlets are at least partly formed by separate members rotatable with the rotor but journaled for rotation relative thereto so as to effect such radial movements of the outlets, and means are provided for rotating all of the journaled members synchronously relative to the rotor and through the same angle.

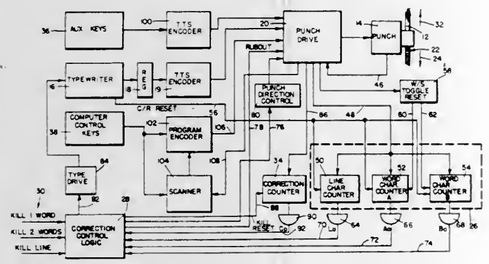
3,580,493
METHOD AND APPARATUS FOR DETECTING SLUDGE LEVEL IN A CENTRIFUGE
Lars-Erik Jonsson, Tumba, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden
Filed Oct. 28, 1968, Ser. No. 770,977
Claims priority, application Sweden, Oct. 31, 1967, 14,886/1967
Int. Cl. B04b *11/02*
U.S. Cl. 233—19 **15 Claims**



A centrifugal rotor has a separating chamber with a sludge-collecting space and also has an indicating channel adapted for passage of an indicating liquid through its radially outer end which is positioned to be blocked by sludge collected to a predetermined level in the collecting space. To detect when the blocking occurs, the apparatus registers a reference pressure condition sensed at a certain point of the indicating channel in a first time period, and this reference pressure condition is compared with an indicating pressure condition

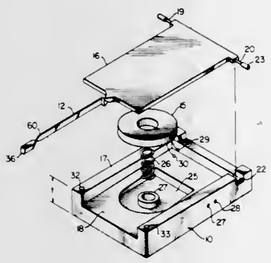
sensed at the same point in a second time period commencing after the beginning of the first time period, these registering and comparing operations being repeated until the difference between the compared pressure conditions acquires a predetermined value indicative of said blocking. The compared pressure conditions may be pressures prevailing at said point at instants constituting said first and second time periods, respectively, or they may be pressure changes sensed at said point during time intervals constituting said first and second time periods, respectively.

3,580,494
APPARATUS FOR THE PRODUCTION OF CODED INTELLIGENCE ON A RECORD MEDIUM
Frank G. Higgason, Jr., Arlington Heights, and Robert J. Sehnert, Palatine, Ill., assignors to Ludlow Typograph Company, Chicago, Ill.
Filed Apr. 21, 1969, Ser. No. 817,987
Int. Cl. G06k *1/02*
U.S. Cl. 234—6 **9 Claims**



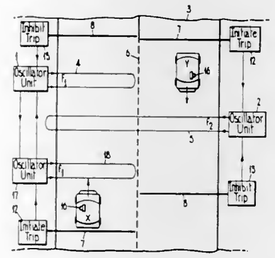
Apparatus produces coded intelligence on a record medium, such as by perforating a moving tape, and has a keyboard input. An error correction capability is provided which utilizes the input data, itself, such as the word spaces, to control the operation of the system for deletion of the unwanted data on the medium. A computer word program capability may also be provided for producing selected multicharacter instruction codes on the medium from a single key at the keyboard.

3,580,495
CODED PUNCH ELECTROMAGNETIC INTERPOSER ASSEMBLY
John Paul Jones, Jr., Wayne, Pa., assignor to Navcor, Inc., a Division of KDI Corporation, Norristown, Pa.
Filed June 6, 1969, Ser. No. 831,190
Int. Cl. G06k *1/05*
U.S. Cl. 234—115 **11 Claims**



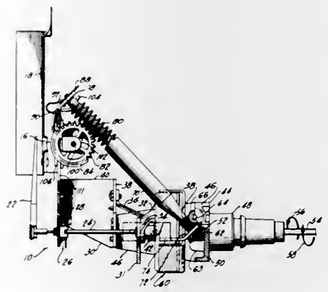
A miniaturized electromagnetic interposer assembly is described capable of high speed operation from electronic trigger pulses and having coil-interposer arrays of dimensions suitable for direct positioning alongside a set of standard paper tape punches stacked in parallel groups for ten punch positions per inch. An interposer member electromagnetically moved between two stable positions includes a semiflexible twisted leaf spring stiff in the direction of movement of an electromagnetically moved member and flexible in the direction of movement of punches in their cutting stroke. The interposers and a punch drive comb assembly attain side by side positions in a notch cut into the side of a punch pin shaft.

3,580,496
COUNTING DEVICE INCLUDING AN ESCAPEMENT WITH NO AUTOMATIC RETURN BIAS
Donald William Neild, Gatley, England, assignor to The General Electric Company Limited, London, England
Filed Oct. 18, 1967, Ser. No. 676,356
Claims priority, application Great Britain, Oct. 21, 1966, 47,177/66
Int. Cl. G08g *1/065*
U.S. Cl. 235—92 **6 Claims**



A counting device for use in a road toll charging or similar system having a counter driven by a long life clockwork-type mechanism whose escapement is controlled by input means responsive to signals radiated by roadside sources. The mechanism is sealed in a tamper-proof casing providing with means for indicating that it is operative. The toll system may produce an incomplete half unit registration when a vehicle carrying the counting device enters a road zone which unit is completed by a further half unit registration as the vehicle leaves the zone.

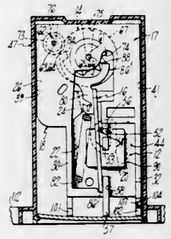
3,580,497
TAMPER PREVENTION APPARATUS FOR ODOMETER
Patrick L. Powell, Franklin Park, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed May 28, 1969, Ser. No. 828,486
Int. Cl. G01c *22/00*
U.S. Cl. 235—96 **20 Claims**



The following specification describes an arrangement for locking a counter or odometer on subtractive operation together with a clutch automatically operated on locking to

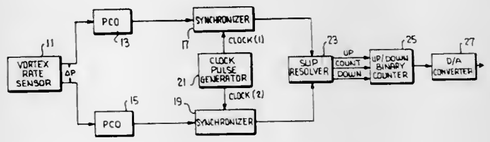
disengage the gear train and avoid damage to the train and effective on normal or additive operation to engage the gear train. A simple spring biased ratchet arrangement between one of the drive wheels and an adjacent higher digit order wheel is also used to permit additive operation and prevent subtractive counter or odometer operation. An additional feature provides a signal in the event of tampering with the odometer by moving one of the higher digit order dials.

3,580,498
ELECTROMAGNETIC COUNTING MECHANISM
Lloyd J. La Pointe, West Hartford; Howard J. Voegelin, Cheshire, and Ernest G. Hoffman, Middlefield, Conn., assignors to Veeder Industries, Inc., Hartford, Conn.
Filed Apr. 4, 1969, Ser. No. 813,490
Int. Cl. G06m *1/02, 1/10*
U.S. Cl. 235—117 **15 Claims**



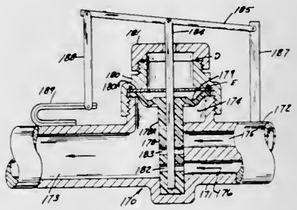
An electromagnetic counting mechanism having a one-piece molded plastic frame with a pair of elongated parallel end supports and an intermediate tubular connector extending transversely therebetween, an electromagnet comprising a coil encircling the tubular connector and a U-shaped magnetic core piece with one leg extending through the tubular connector and a second leg extending between the supports, a counter mounted between the supports, and a counter drive mechanism mounted on one of the supports in operative relationship with the electromagnet and counter for indexing the counter upon momentary energization of the electromagnet. The end supports of the frame are contoured to permit access to the tubular connector 360° thereabout and along its full length to provide for winding the coil about the tubular connector by treating the entire frame as a bobbin in conventional coil winding apparatus, and the remaining parts of the counting mechanism are assembled on the frame after the bobbin is wound.

3,580,499
FLUIDIC SLIP-RESOLVER SYSTEM
Peter Bauer, Germantown, and William R. Mentzer, Jr., Silver Spring, both of, Md., assignors to Bowles Fluidics Corporation, Silver Spring, Md.
Filed Oct. 30, 1968, Ser. No. 771,758
Int. Cl. G06d *5/00*
U.S. Cl. 235—201 **19 Claims**



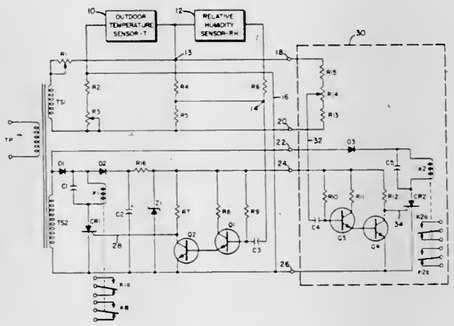
A fluidic system for monitoring relative frequency variations between two fluid pulse trains includes a fluidic clock pulse generator, a fluidic time synchronization circuit, a fluidic slip-resolver circuit and a fluidic up-down binary counter. The two fluid pulse trains are time synchronized and fed to a slip-resolver circuit, the output stage thereof providing output pulses when two or more successive pulses occur in one input pulse train between successive input pulses in the other train. Output pulses from the slip-resolver are counted by an up-down counter. Logic circuitry is provided to determine up or down counting modes in accordance with which input pulse train is increasing in frequency. In addition, fluidic switching circuits in the system receive sharply defined switching pulses by utilizing a shaper.

3,580,500
MODULATING VALVE CONSTRUCTION
Frederic R. Quinn, Red Hook, N.Y., assignor to Zyrotron Industries, Inc., South Hackensack, N.J.
Division of Ser. No. 707,014, Feb. 12, 1968. This application Apr. 3, 1969, Ser. No. 813,226
Int. Cl. G05d *11/16;* **F16k** *19/00*
U.S. Cl. 236—12 **2 Claims**



This disclosure is directed to a fluid mixing system utilizing modulating valves responsible to the pressure of an independent actuating fluid operating on a diaphragm operatively connected to the valving member for controlling the fluid flow therethrough. The disclosure further contemplates controlling the pressure of the valve actuating fluid in response to temperature. The disclosure also contemplates a diaphragmed mixing valve for controlling the mixing of at least two fluids in response to the temperature of the resulting mixed fluids.

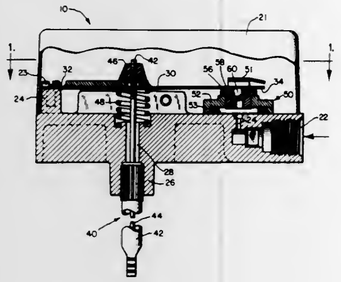
3,580,501
HUMIDITY AND TEMPERATURE SENSING AND CONTROL CIRCUIT
Donovan P. Streed, Rte. 2, Shakopee, Minn.
Filed Mar. 25, 1969, Ser. No. 810,309
Int. Cl. G05d *22/02*
U.S. Cl. 236—44 **6 Claims**



An electronic relative humidity sensing and control circuit having outdoor temperature reset is described. A circuit having temperature and humidity sensors arranged in a bridge circuit for providing control signals to a transistor amplifier is shown for controlling humidity-determining equipment. Ad-

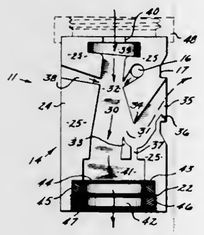
ditional bridge circuitry is also shown for automatically sensing an controlling heating and air conditioning equipment in response to sensed changes in outdoor temperature.

3,580,502
THERMOSTATIC PRESSURE TRANSMITTER
Ernest J. Duchek, Prospect Heights, Ill., assignor to Powers Regulator Company, Skokie, Ill.
Filed Mar. 28, 1969, Ser. No. 811,526
Int. Cl. G05d *23/275*
U.S. Cl. 236—102 **7 Claims**



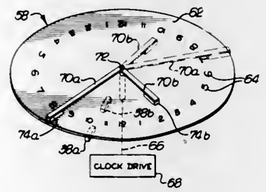
A temperature actuated pressure transmitter adapted to sense a temperature and transmit a proportional fluid signal. The transmitter includes a fluid pressure chamber, a cantilevered blade having a free end extended longitudinally adjacent said pressure chamber, a temperature sensing element adapted to transmit a force to said blade in response to a sensed temperature, and an exhaust nozzle assembly positioned in fluid communication with said chamber through which the fluid in said chamber can be exhausted. A valve member provided in an exhaust port of said nozzle assembly is engaged with the free end of said blade and is adapted to vary the rate of exhaust through said port and thereby vary the pressure in said chamber in accordance with the force transmitted to the valve member through the lever arm of said blade. The pressure in said chamber is thereby changed in proportion to the temperature sensed by said sensing means. In accordance with this invention, the nozzle assembly can be translated longitudinally with respect to the blade to adjust the span of the transmitter by adjusting the effective lever arm through which said blade operates against the valve member.

3,580,503
AERATOR AND FOUNTAIN ATTACHMENTS FOR FAUCETS
James T. Ligon, 800 South Main, Almont, Mich., and David L. Lang, 475 Main St., Rochester, Mich.
Filed Sept. 19, 1969, Ser. No. 859,330
Int. Cl. E03b *9/20*
U.S. Cl. 239—25 **7 Claims**



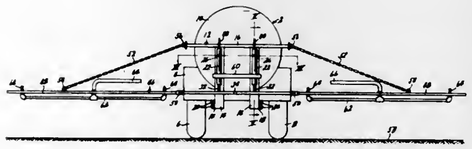
An aerator and fountain attachment which converts selectively an ordinary faucet into a drinking fountain and/or an aerating tap and with no moving parts. Flow directing channels are provided in a base element and the flow directing channels are aspirated through the base element. When specific aspiration is prevented the flow is shifted so that a portion of the flow is diverted from passing axially through the base element and is moved in a radial and upward disposition until aspiration is again permitted and then the flow is redirected in a normal aerating flow path through the attachment.

3,580,504
IRRIGATION CONTROL APPARATUS
Ralph E. Benham, Arcadia, Calif., assignor to Purex Corporation, Ltd., Lakewood, Calif.
Filed Jan. 24, 1969, Ser. No. 793,669
Int. Cl. A01g *27/00*
U.S. Cl. 239—70 **9 Claims**



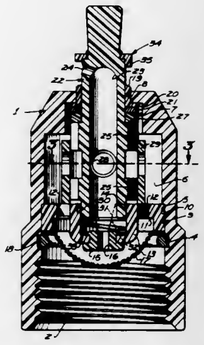
Automatic, remote operation of irrigation systems is provided without the use of central power facilities by controlling periodic water delivery to the irrigating heads through the use of battery charged capacitors to sequentially operate an electrically responsive valve actuator to open and close a valve in a predetermined time relation.

3,580,505
SPRAYER BOOM ASSEMBLY
Herbert V. Loeffler, Rte #2 & 71 By-Pass, Lee's Summit, Mo.
Filed Apr. 18, 1969, Ser. No. 817,437
Int. Cl. B05b *1/20*
U.S. Cl. 239—168 **8 Claims**



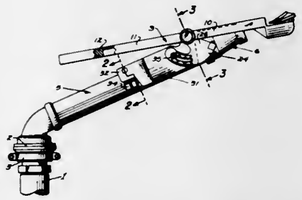
A sprayer boom assembly adapted to be mounted on a truck or other vehicle and including an elongated boom having a spray nozzles spaced therealong, said boom being disposed horizontally and transversely of the vehicle, extending outwardly at both sides of the vehicle, and including a central boom section suspended from the vehicle on a fore-and-aft axis by resiliently yieldable means whereby to remain generally horizontal when the vehicle tilts laterally, a pair of outer boom sections each pivoted for vertical movement to the contiguous end of said central section, and flexible strand supporting each of said outer boom sections in a normally horizontal position, and said strands being connected to said vehicle at points above the pivots of said outer boom sections.

3,580,506
BEARING FOR IMPACT MOTOR DRIVEN SPRINKLER
Robert B. Costa, Covina, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.
Filed Mar. 21, 1969, Ser. No. 809,190
Int. Cl. B05b *3/02*
U.S. Cl. 239—230 **4 Claims**



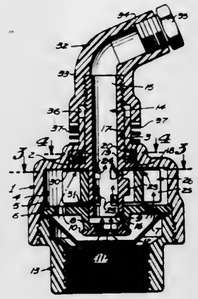
A bearing at the water entrance end of an impact motor for rotating sprinkler formed by the lower end of a tubular rotor and the walls of a surrounding socket, the bottom end of the socket having an inlet port of smaller diameter than the bore through the rotor so that incoming water and particles therein are jetted into the bore in such a manner that water flow between the confronting surfaces of the bearing is minimized.

3,580,507
DRIVE MECHANISM FOR LARGE VOLUME ROTARY SPRINKLERS
John D. Beamer, West Covina, Calif., assignor to Rain Bird Sprinkler Mfg. Corp., Glendora, Calif.
Filed June 9, 1969, Ser. No. 831,362
Int. Cl. B05b *3/08*
U.S. Cl. 239—233 **6 Claims**



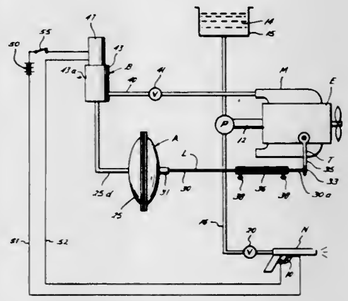
A drive mechanism for large volume rotary sprinklers having an upwardly sloping barrel rotatable about a vertical axis and terminating in a nozzle. An arm is supported intermediate its ends from the barrel for oscillation about a horizontal axis alongside the barrel. One end of the arm extends beyond the nozzle and is provided with a vane and a deflector spoon which move periodically into the water stream issuing from the nozzle to disrupt the stream and produce reaction forces which cause oscillation of the arm as well as rotation of the barrel, and the remaining end of the arm carries a counterbalance. A snubbing structure is journaled about the same axis as the arm and includes an adjustably connected snubber lever and counterbalance weight, the snubber lever being engaged after a preselected free travel of the arm, to lift the counterbalance weight.

3,580,508
MOTOR FOR ROTATING JET SPRINKLER
Ali Marandi, Azusa, and Kenneth H. Solomon, Claremont, both of, Calif., assignors to Rain B ird Sprinkler Mfg. Corp., Glendora, Calif.
Filed Mar. 25, 1969, Ser. No. 810,132
Int. Cl. B05b *3/04*
U.S. Cl. 239—241 **2 Claims**



An impact type motor for rotating jet sprinklers in which impact lobes protruding from a rotor member are engaged by a polygonal impact ring; more particularly, to the construction in which the motive water is caused to flow over the axial ends of the impact ring thereby suspending the impact ring essentially friction free in the motor chamber.

3,580,509
CONTROL APPARATUS FOR HIGH-PRESSURE WATER SYSTEM
John B. Goss, 10950 Old Katy Road, Houston, Tex.
Filed Jan. 6, 1969, Ser. No. 789,238
Int. Cl. F02d *11/08*
U.S. Cl. 239—302 **9 Claims**



Control apparatus for a pump powered by a gasoline engine or the like wherein means are connected to the exhaust manifold of the engine for increasing the pump speed and the fluid delivered by such pump to a nozzle at a point remote from the pump.

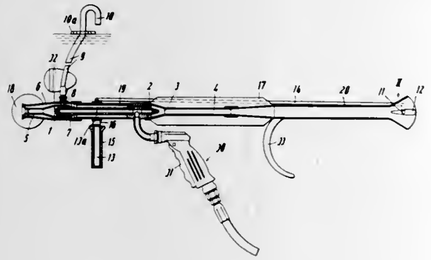
3,580,510
ALL-DIRECTION ATOMIZERS
George X. Batlas, Astoria, N.Y., assignor to Vincent Longo, Oceanside, N.Y.; Curtis F. Pearl and Anthony Genantonio, Teaneck, N.J., part interest to each
Filed June 23, 1969, Ser. No. 835,504
Int. Cl. B65d *1/32*
U.S. Cl. 239—327 **10 Claims**

A resilient squeeze bottle has an elongated stopper extending downwardly therein, which provides an air duct and a

liquid duct extending therealong; said ducts being communicative with a slight mixing chamber at their upper ends, which chamber has an upward discharge orifice. The liquid duct has a branch extending upwardly where it is communicative with the bottle's interior at neck region, and said

liquid duct also has a downward extension to the bottom of the bottle. Said stopper has a downward openwork element. Both said stopper and element serve to limit the extent the bottle can be collapsed. The open end of the air duct is always above the liquid in the bottle regardless of the bottle's position when squeezed or not squeezed.

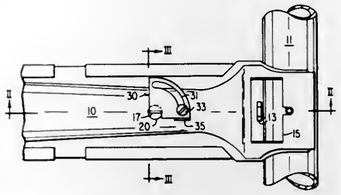
3,580,511
SUBMERSIBLE CLEANING GUN
Paul Hammelman, Zum Sundern 17, 474 Oelde Westphalia, and Heinz Lettmann, Im Schilffeld 19, 4832 Wiedenbruck, both of, Germany
Filed Dec. 27, 1968, Ser. No. 787,535
Claims priority, application Germany, Dec. 29, 1967, P 15 31 571.6
Int. Cl. B05b *7/02*
U.S. Cl. 239—419.5 **14 Claims**



A submersible cleaning gun having a working nozzle which discharges a jet of pressurized water against the surfaces of submerged bodies. The support for the working nozzle carries a reaction nozzle which discharges pressurized water in a direction counter to the direction of discharge from the working nozzle to thus facilitate underwater manipulation of the gun. The support for the nozzles carries one or more inflatable and deflatable floats which determine the buoyancy of the gun. A handle is used to adjust the floats as well as to adjust a steering flap at the rear end of the gun.

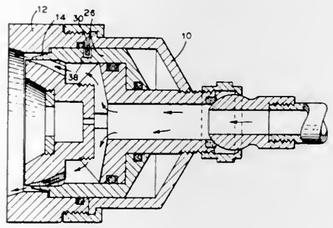
3,580,512
GAS BURNER
Donald R. Smith, Diamond Bar, and Adrian V. Cavestany, Pasadena, Calif., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Sept. 15, 1969, Ser. No. 857,973
Int. Cl. B05b *7/06*
U.S. Cl. 239—432 **6 Claims**

A thin flat vane is disposed diametrically across the throat or air-gas passageway of the burner. The vane is mounted for rotation about its axis for movement of the flat side surfaces of the vane from a position parallel to the air-gas flow, in which it creates substantially no turbulence in the flow, to a position transversely of the flow in which it creates maximum



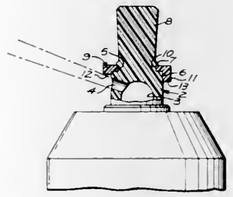
turbulence therein. Increase in turbulence effects reduction of the volume of air in the mixture.

3,580,513
SHOWER HEAD
George Martin, Louisville, Ky., assignor to American Standard Inc., New York, N.Y.
Filed Jan. 31, 1969, Ser. No. 795,644
Int. Cl. B05b *1/32*
U.S. Cl. 239—460 **14 Claims**



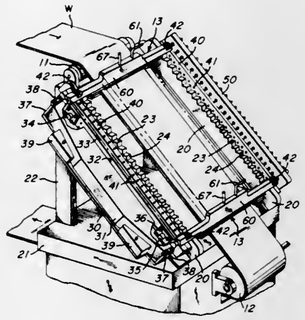
An adjustable shower head for the distribution of liquids having a control for regulating the flow of the spray. The shower head is constructed so that the forward pressure of the liquid on the shower head nozzle does not cause relative movement of the shower head parts. A piston-type of arrangement is employed wherein no fluid pressure is developed which acts on the adjusting mechanism.

3,580,514
DISTANCE SELECTOR FOR SPRINKLERS
Tony Radecki, West Covina, Calif., assignor to Rain Bird Sprinkler Mfg., Glendora, Calif.
Filed Apr. 2, 1969, Ser. No. 812,625
Int. Cl. B05b *1/26*
U.S. Cl. 239—521 **2 Claims**



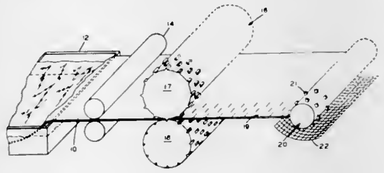
A distance selector for a sprinkler having an upwardly projecting stem in which is formed an upwardly and outwardly directed orifice, the selector being in the form of a ring rotatably mounted on the stem above the orifice and having a depending rim of varying depth which on rotary adjustment of the ring intercepts the water stream varying amounts; the stem having a handle projection so that the stem may be restrained to permit adjustment of the ring.

3,580,515
ALIGNMENT SYSTEM FOR ARRAYS OF A NONCONTACTING PRINTER
William Guy Cassill, McArthur, Ohio, assignor to The Mead Corporation, Dayton, Ohio
Filed Oct. 1, 1969, Ser. No. 862,718
Int. Cl. B05b *1/14*
U.S. Cl. 239—536 **12 Claims**



A noncontacting printing system in which images are formed on a moving web by projecting drops of ink or the like onto the web. The drops are projected from a series of coating heads, each of which has a series of passages for projecting the drops, and structure is provided for supporting and positioning the coating heads with their passages offset with respect to each other to the extent that the drops may be projected onto the web in close enough relationship to each other to give a continuous coating, if desired.

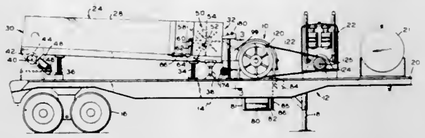
3,580,516
METHOD OF SEPARATING A SHEET INTO CHIPS
Virgil Spencer, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.
Division of Ser. No. 658,675, Aug. 7, 1967, Pat. No. 3,527,418, Sept. 8, 1970. This application Nov. 13, 1969, Ser. No. 871,284
Int. Cl. B02c *18/06, 18/44*
U.S. Cl. 241—25 **1 Claim**



Method of separating a sheet into chips for use in the formation of a floor covering. Plastic particles are calendered into a sheet which is cooled by a cooling bath. The sheet is fed into a slitter which places intermittent cross-machine direction slits in the sheet. The sheet is then fed into a grinder where the knife-hammers traveling at high speed fracture the sheet into irregularly shaped chips.

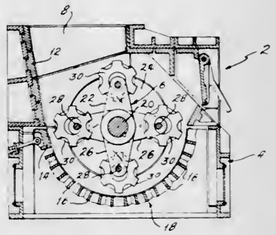
3,580,517
APPARATUS FOR CHIPPING SCRAP MATERIALS
Stanley V. Ehrlich, Portland, Oreg., assignor to Western Manufacturing, Inc., Portland, Oreg.
Filed Mar. 8, 1968, Ser. No. 711,658
Int. Cl. B02c *13/04, 18/06, 13/286*
U.S. Cl. 241—186 **29 Claims**

An apparatus for reducing bulk materials such as scrap lumber, metal and masonry to fist-sized chunks to facilitate disposal of the same. Sharp-pointed, hammerlike knives pivoted between pairs of spaced plates on a common horizontal driven shaft pass downwardly in sequence past an anvil to shear off pieces of scrap fed across the anvil. Materials too bulky or hard to be sheared by the knives pivot the knives rearwardly to increase the clearance between knives and anvil and thus permit such materials to pass through the apparatus without damaging the mechanism. The apparatus



is mounted on a wheeled vehicle which also carries a vibratory conveyor and comblike material straightener for feeding scrap into the chipping apparatus in an orderly manner and at a predetermined rate.

3,580,518
RING HAMMERS
Sven B. Strom, St. Louis, Mo., assignor to American Pulverizer Company, St. Louis, Mo.
Filed Nov. 1, 1968, Ser. No. 772,505
Int. Cl. B02c *13/28, 13/04*
U.S. Cl. 241—193 **15 Claims**



A ring hammer for use on the rotor of a material reducing machine and having a plurality of generally radial teeth which are interconnected by integrally formed fillets. The fillets, axially narrower than the teeth, act to prevent scrap material from lodging between the teeth to thus avoid any distending of the ring hammers. Furthermore, the fillets have cutting edges which extend continuously between adjacent teeth and act along with the teeth to shred material.

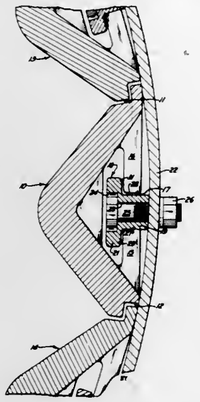
3,580,519
PROCESS FOR HINDERING THE AGGLOMERATION OR REAGGLOMERATION OF GROUND FINELY DIVIDED POWDERED SUBSTANCES
Kurt Klein, Langen, Hessen; Gerd Lumbeck, Gross-Auheim, and Joachim Maluzi, Gross-Auheim, Germany, assignors to Deutsche Gold-Und Silber-Scheidean-stalt vormals Roessler,, Frankfurt, Main, Germany
Filed Mar. 25, 1968, Ser. No. 715,581
Claims priority, application Germany, Mar. 23, 1967, D52612
Int. Cl. B02c *19/00, 23/06*
U.S. Cl. 241—22 **3 Claims**

Process for protecting ground finely divided powdered substances against agglomeration or reagglomeration wherein the substance to be protected is finely ground together with a finely divided hydrophobic silica or wherein a mixture of finely divided hydrophobic silica and finely divided hydrophilic silica is added to the substance to be protected already in finely ground state and intensively mixed therewith in a mill having a grinding action.

3,580,520
BREAKER PLATE ASSEMBLY FOR A DISINTEGRATOR
Thomas Leroy Myers, Lawrenceburg, Ind., assignor to Stedman Foundry and Machine Company, Incorporated, Aurora, Ind.
Filed Oct. 29, 1968, Ser. No. 771,524
Int. Cl. B02c *17/22*
U.S. Cl. 241—299 **4 Claims**

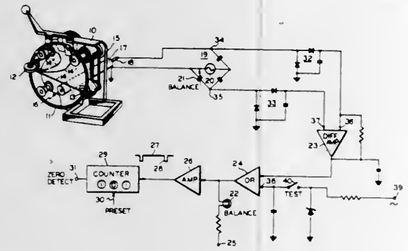
A disintegrator of the type used in the sand and gravel in-

dustry. The breaker plate assembly of such a disintegrator is formed with two opposed projecting ribs, the ends of which form an opening for receiving a T-bar. A bolt passes through



the T-bar and through the housing of the disintegrator through which means the breaker plate is secured to the housing in a manner to allow slight relative movement between the breaker plate and the housing.

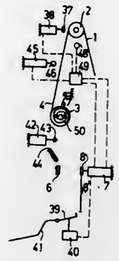
3,580,521
COIL WINDER AUTOMATICALLY SEQUENCING MULTIPLE PRESET WINDING SELECTIONS
Richard Settanni, Bethel, Conn., assignor to Leesona Corporation
Filed Mar. 25, 1969, Ser. No. 810,215
Int. Cl. H01f *41/08*
U.S. Cl. 242—4 **10 Claims**



A toroidal coil winder is disclosed with electronic turn counter equipment and preset turn count registers, including program control circuits for automatically stepping through an ordered array of turn count registers for successive windings on a single core.

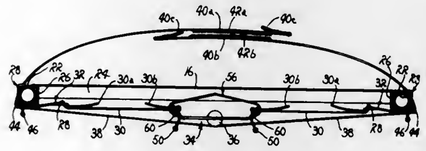
3,580,522
METHOD AND ARRANGEMENT FOR WINDING UP A CONTINUOUS WEB
Viggo Rasmus Hansen, Naestved, and Per Juel Hagemeister, Glostrup, Denmark, assignors to C. A. Harnden Limited, Hyde/Chesire, England
Filed Nov. 4, 1968, Ser. No. 773,080
Claims priority, application Denmark, Nov. 9, 1967, 5582/67
Int. Cl. B65h *19/20*
U.S. Cl. 242—56 **9 Claims**

A method of winding a continuous web to form wound packages comprises the following steps: Winding on a run of the web to a winding element thus forming a wound package; removing said winding element from said wound package; moving away said wound package; holding fast said web at a holding point between said winding element and said wound package; bringing said winding element again into engagement with said web and beginning a new winding operation for only a few revolutions; cutting through said web between said winding element and said holding point; finishing said new winding operation. An apparatus for carrying out said



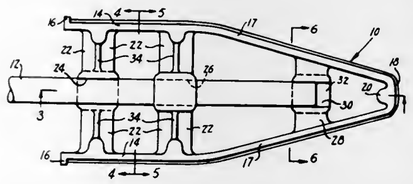
method comprises a winding element consisting of two rotating grippers which can be moved in axial direction, a holding device for holding fast said web arranged below said winding element, and a cutting device arranged between said winding element and said holding device.

3,580,523
RETRACTABLE SAFETY BELT FOR HOSPITAL GURNEYS AND THE LIKE
Walter George Preston, Tulare, Calif., assignor to John T. Posey
Filed Nov. 14, 1968, Ser. No. 775,793
Int. Cl. B65h *75/48*
U.S. Cl. 242—107.1 **11 Claims**



A safety belt for use on patient supporting hospital equipment such as operating tables, gurneys, wheelchairs and the like which includes an elongated restraining strap adapted to be disposed in transversely circumscribing relation about the patient support and having opposite releasably connectable ends disposed in overlapping position about the patient. The strap has an intermediate portion connected to a retracting roller releasably detachable anchored to the hospital equipment, the strap in extended patient circumscribing relation serves to hold the anchors more securely in place.

3,580,524
UNIVERSAL YARN SPOOL HOLDER
Eugene E. Weaver, 1334 Stuart St., Chattanooga, Tenn.
Filed Dec. 1, 1969, Ser. No. 881,140
Int. Cl. B65h *49/00*
U.S. Cl. 242—129.7 **7 Claims**

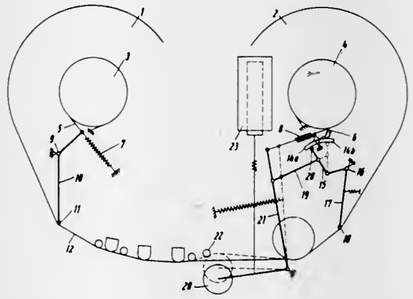


A yarn spool holder of unitary construction having a tapered U-shaped configuration with crossmembers secured to the rod on the creel by a wedging action thereby eliminating the use of setscrews, wrenches and the like for securing the holder on the rod and enabling the spool to be placed on

the holder by employing only one hand.

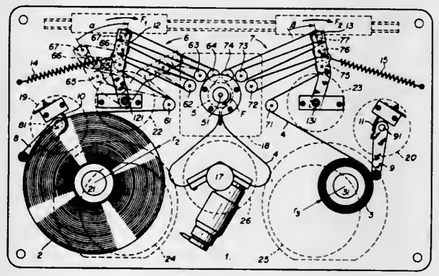
The present invention generally relates to a yarn spool holder for use in tufting machines.

3,580,525
ARRANGEMENT MAINTAINING CONSTANT TAPE TENSION IN MAGNETIC TAPE RECORDERS
Horst Dopner, Bensberg-Frankenforst, Germany, assignor to Telefunken, Patenverwertungsgesellschaft m.b.H., Ulm Donau, Germany
Filed Nov. 21, 1968, Ser. No. 777,803
Claims priority, application Germany, Nov. 21, 1967, P 15 49 107.3
Int. Cl. B65h *59/38;* **G03b** *1/04;* **G11b** *15/32*
U.S. Cl. 242—189 **10 Claims**



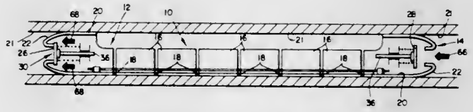
Arrangement for maintaining constant the tension of the tape on the reels of a magnetic tape recorder during its normal forward and rewind operations. Feeler means is disposed in the path of the tape near the takeup reel. Such feeler means is arranged to respond to the tension in the tape to control the brake associated with the takeup spindle. Means are provided for automatically reversing, during rewind operation, the effect which the feeler means has on such brake during normal forward operation and thereby providing a control of the tension in the tape for both normal forward and rewind operations.

3,580,526
APPARATUS FOR STORING AND WINDING DISCONTINUOUSLY AND REVERSIBLY MOVING TAPE
Michel Wichoud, 1, rte de Drize 1227, Geneva, and Jean Pierre Engel, 3, Rue Schaub 1202, Carouge-Geneva, both of, Switzerland
Filed Sept. 5, 1969, Ser. No. 855,550
Claims priority, application Switzerland, Sept. 6, 1968, 13432/68
Int. Cl. B65h *59/38;* **G03b** *1/04;* **G11b** *15/32*
U.S. Cl. 242—190 **6 Claims**



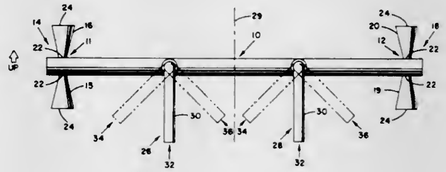
In apparatus for storing and winding tape travelling discontinuously and reversibly through a reading unit and comprising drive means for reversibly driving the tape through the reading unit and a pair of reversibly driven spools off which and on to which the tape is wound, the provision of a takeup system, including a pair of pulley arrangements on opposite sides of the drive means, responsive to variations in the length of the tape paths between the spools and the drive means, and electrical means controlled by the takeup system to restore the proper driving relationships between the spools and the tape as it passes through the reading unit.

3,580,527
ARTICULATED CARTRIDGES FOR PNEUMATIC CONVEYANCE
Simon Cynober, Bezons, France, assignor to Saunier Duval, Paris, France
Filed Sept. 16, 1968, Ser. No. 762,253
Int. Cl. B65g *51/04*
U.S. Cl. 243—38 **9 Claims**



This disclosure includes a method and apparatus for propelling a cartridge through a pneumatic tube by creating a pressure differential within the tube and for braking the cartridge by reversing the pressure differential. Valve means are provided in each end of the cartridge to enable the pressure differential to act on the leading end of the cartridge when propelling the cartridge and to act on the trailing end of the cartridge during braking so that longitudinal compression of the cartridge is precluded.

3,580,528
MANEUVERING UNIT
William C. Boyce, and Edward C. Matza, Dallas, Tex., assignors to LTV Aerospace Corporation, Dallas, Tex.
Filed Feb. 3, 1969, Ser. No. 795,794
Int. Cl. B64g *1/20*
U.S. Cl. 244—1 **10 Claims**

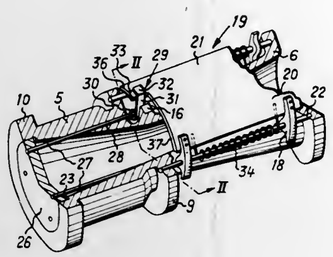


A hand-held device for propelling an individual through space wherein pressurized fluid is selectively and individually discharged from oppositely directed coplanar nozzles in response to movement of a pair of control handles relative to a supporting member.

3,580,529
ROCKET WITH SPREADABLE EMPENNAGE
Xaver Suter, Ruschlikon, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle A.G., Zurich, Switzerland
Filed Sept. 12, 1968, Ser. No. 759,364
Claims priority, application Switzerland, Sept. 21, 1967, 13225/67
Int. Cl. F42b *13/32*
U.S. Cl. 244—3.29 **5 Claims**

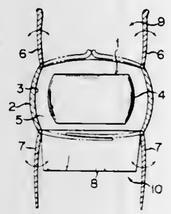
Rocket with spreadable empennage comprising a nozzle body with pivotally mounted individual fins located around said body. Holding means releasable by gas pressure holding the fins in their folded-in position. The holding means for each fin comprising a holding member removable from said nozzle body supported in said nozzle body. A locking

member cooperating with the holding member locks the fin and when the holding member is removed, releases the fin.



The holding member extends inside the external surface of the nozzle body behind each fin.

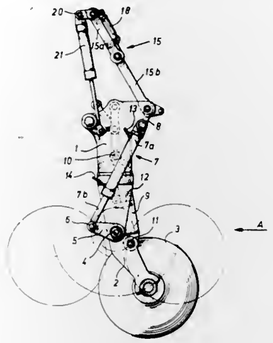
3,580,530
LIFT FAN INSTALLATION OF VERTICAL OR SHORT TAKE-OFF AND LANDING AIRCRAFT
Misao Wada, Fujisawa-shi, and Kiyoshi Soda, Yokohama-shi, Japan, assignors to Japan Aircraft Manufacturing Co., Ltd., Yokohama-shi, Japan
Filed Feb. 25, 1969, Ser. No. 802,192
Claims priority, application Japan, Nov. 9, 1968, 43/81622
Int. Cl. B64c *29/04;* **F02k** *3/04*
U.S. Cl. 244—54 **3 Claims**



A lift fan installation of vertical or short takeoff and landing aircraft has a single or plurality of lift fan assemblies, and a casing or casings for housing said lift fan assembly. Said lift fan assembly involves a gas generator, a fan driven by the fluid derived from said generator, and an engine body in which said generator and fan are disposed. Between the inner wall of the casing and the outer wall of the engine body is defined an air passage, the effective cross-sectional area of which is less than one and a half times that of the exhaust duct of said lift fan assembly.

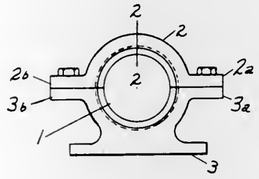
3,580,531
RETRACTABLE MAIN CARRIAGE FOR VERTICALLY STARTING AIRPLANES AND AIRPLANES STARTING ON A SHORT RUNWAY
Gerhard Bock, Bremen; Rolf Riccius, Worpswede; Gunter Weitkamp, and Bernhard Wolf, Bremen, Germany, assignors to Vereinigte Flugtechnische Werke Gesellschaft mit beschrankter Haftung fruher "Wesert" Flugze ugbau/Focke-Wulf/Heinkel-Flugzeugbau, Hunefeldstrasse, Bremen, Germany
Filed July 19, 1968, Ser. No. 746,015
Int. Cl. B64c *25/10*
U.S. Cl. 244—102 **2 Claims**

A retractable main landing gear located behind the center of gravity of the airplane and comprising an adjusting mechanism operable selectively to adjust the landing wheel from a front supporting position, in which the landing wheel is closer to the center of gravity of the airplane, to a rear supporting position, in which the landing wheel is farther away



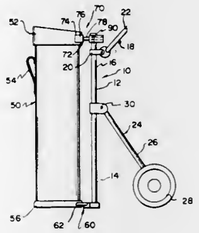
from the center of gravity of the airplane, while the base or area over which the airplane is supported is increased.

3,580,532
TRUNNION MOUNTING
Regis V. Schmitt, Erie, Pa., assignor to Lord Corporation, Erie, Pa.
Filed Mar. 2, 1970, Ser. No. 15,787
Int. Cl. B60k *1/00*
U.S. Cl. 248—9 **4 Claims**



The service life of bonded elastomer trunnion mountings is improved by tapered annular grooves in the outer surfaces of the elastomer adjacent the split metal ring by which the mounting is seated in the trunnion support.

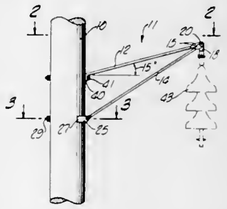
3,580,533
GOLF CART BAG SECUREMENT APPARATUS
George W. Nordland, 8800 S. Harlam, Lot 119, Oak Lawn, Ill.
Filed Apr. 8, 1969, Ser. No. 814,273
Int. Cl. A63b *55/08*
U.S. Cl. 248—96 **5 Claims**



An apparatus for removably connecting a golf bag to a golf cart. The apparatus includes a bag supporting base portion

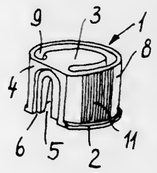
on the frame of the cart which serves to removably retain a loop member connected near the bottom of a golf bag in a recess formed in the base portion and a locking device having an element connected near the upper end of the golf bag which is cooperable with an element on the cart frame to permit the ready removal of the bag from the cart.

3,580,534
SUSPENSION BRACKET FOR CONDUCTOR INSULATOR
L. E. Lindsey, 222 Vista Ave., Pasadena, Calif.
Filed June 16, 1969, Ser. No. 833,360
Int. Cl. H02g *7/20*
U.S. Cl. 248—221 **5 Claims**



A triangular suspension bracket for supporting a power conductor offset from a pole or the like and having one member in tension and two longer underlying diverging legs loaded in compression and supplementing one another in resisting sidewise sway.

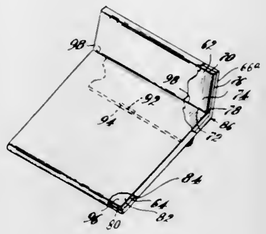
3,580,535
CONNECTING FIXTURE
Christoph Naske, Froschhausen, Germany, assignor to WHB-Anbaumobel von Poschinger K.G., Murnau, Germany
Filed Apr. 24, 1970, Ser. No. 31,583
Claims priority, application Germany, Apr. 24, 1969, G6916620.7
Int. Cl. A47g *29/02*
U.S. Cl. 248—239 **4 Claims**



A two-piece fixture for connecting two shelf parts or the like at right angles to each other consisting of a headed locking pin projecting from one side of one shelf part, and a cup-shaped slotted element to be mounted in one end of the other shelf part and adapted to be hooked laterally over the headed projecting part of the locking pin and to draw the two shelf parts tightly together. The largest part of the periphery of the cup-shaped element has a double wall, while the remaining part is formed by a single thicker wall which is flat at its outer side and provided with an axially extending slot which has an open end at the open side of the cup. The inner wall surface at least of this single-wall portion is inclined, tapering from the open end of the slot toward its closed end.

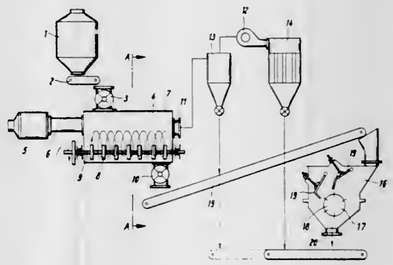
3,580,536
SLANT FRONT EASEL
Gordon E. Nichols, Middleboro, Mass., assignor to Winthrop-Atkins Co., Inc., Middleboro, Mass.
Filed Aug. 7, 1968, Ser. No. 750,985
Int. Cl. A47b *97/08*
U.S. Cl. 248—459 **3 Claims**

An easel-type mount having a headboard and baseboard disposed at an angle to each other such that the headboard rises at a relatively steep angle to the baseboard and the baseboard slopes downwardly from the headboard at a rela-



tively flat angle, and a leg and brace for holding the headboard and baseboard at said angle.

3,580,537
PROCESS FOR DRESSING ASBESTOS ORE WASTE
Ehrhardt Andreas, Munster in Westfalen, Germany, assignor to Hazemag Hartzerkleinerungs-Und Zementmaschinenbau-Gesellschaft, m.b.h., Munster, Westphalia, Germany
Filed June 19, 1969, Ser. No. 834,694
Claims priority, application Germany, June 20, 1968, P 17 60 686.9
Int. Cl. B27k *7/00;* **B27i** *9/00;* **B27l** *11/00*
U.S. Cl. 241—4 **10 Claims**

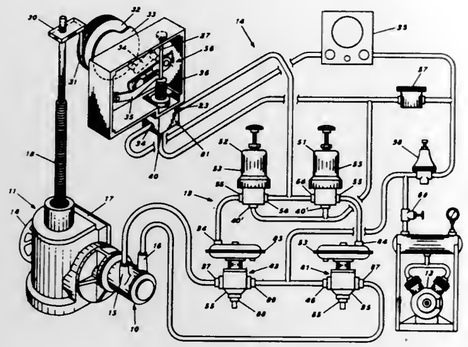


A process for dressing asbestos ore waste in which the waste material is dried by whirling it through a stream of hot gas to prevent encrustation of the material during the drying process and to separate at least some of the asbestos fibers from the ore waste and by subsequently comminuting the material in an impact breaker to separate substantially all remaining fibers from the ore and the fibers from each other.

3,580,538
PNEUMATIC SYSTEM FOR AIR MOTOR CONTROL
Leon M. Wyrick, Pleasant Hill, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Continuation-in-part of application Ser. No. 492,191, Oct. 1, 1965, now abandoned. This application Nov. 20, 1968, Ser. No. 786,527
Int. Cl. F15b *13/16;* **F16k** *13/12*
U.S. Cl. 251—29 **7 Claims**

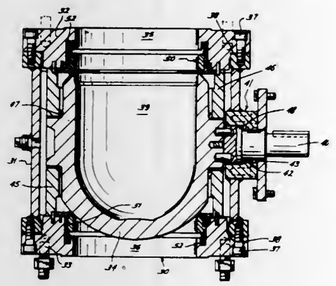
In a pneumatic amplifying and actuating circuit for a control system useful in controllably varying a stem of a valve within a process line, complementary output stages of the

amplifying and actuating circuit are separately utilized (depending on the direction of deviation of a control signal with



respect to a setpoint pressure level) to automatically control the repositioning of the valve stem.

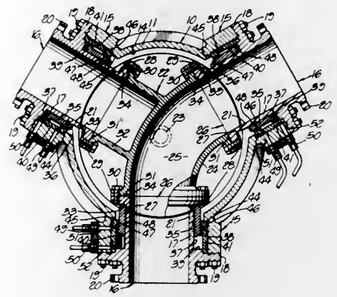
3,580,539
VALVE SEAL AND SYSTEM
Davis A. Van Scoy, Houston, Tex., assignor to Helmerich & Payne, Inc., Houston, Tex.
Filed Jan. 15, 1968, Ser. No. 697,979
Int. Cl. F16k *25/00*
U.S. Cl. 251—159 **14 Claims**



A hydraulically retractable valve seal comprising a sleeve seat member mounted for limited sliding movement in a counterbored flow passage of a valve. The seat member is biased toward the closure member of the valve by springs mounted between an outwardly flaring flange portion of the seat member and the valve body. A resilient sealing member is mounted on the inner face of the seat member for sealing contact with the valve closure member. An annular chamber is formed between the counterbore of the valve body and the cylindrical exterior of the seat member. This chamber is sealed at one end by a stationary ring seal connected to the valve body and at the other end by a ring seal connected to the seat member flange for sliding contact with the counterbore. The annular chamber is connected to a pressure source for selectively overcoming the spring bias to retract the seat member and consequently the sealing member from sealing contact with the valve closure member.

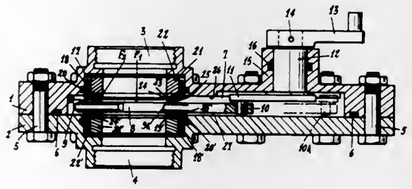
Also, a system employing a valve equipped with the seal described comprising an electrical power source for energizing relay and time delay devices to first activate a pump for retracting the seal then second activate an operator for rotating the valve closure member only after the seal is completely disengaged therefrom. A limit switch attached to the operator deenergizes the electrical circuits, after complete rotation of the closure member, to stop the pump and relieve pressure from the annular chamber of the valve seal. The seal once again engages the closure member under spring bias.

3,580,540
ROTATABLE MULTIPORT VALVE WITH FLUID PRESSURE CONTROLLED VALVE MEANS
Irving Joseph Heinen, 3758 Parkview Drive, Lakewood, Calif.
Filed Oct. 3, 1968, Ser. No. 764,743
Int. Cl. F16k *5/18*
U.S. Cl. 251—159 **1 Claim**



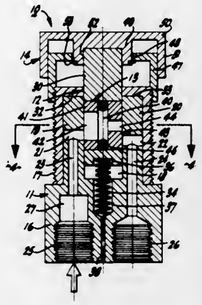
A rotatable multiport valve structure which is susceptible of use, for example, in two, three, or four-way, and the like flow control valves, and includes a hollow valve body within which there is rotatably mounted a normally freely rotatable flow control gate means containing flow passages or channels which are selectively positionable in registration with body ports communicating with flow passages having connector members for connection with conduits. Sealing of the registered flow channels or passages at each port is accomplished by means of a fluid pressure actuated ring piston reciprocally motivated to seated and nonseated positions at its inner end with respect to an annular seat carried by the rotatable gate means, and wherein the piston in seated position acts to lockingly retain the gate means against movement.

3,580,541
COCK
Marcel Bouhot, 35 Avenue du General Sarrail, Paris, France
Filed Jan. 22, 1970, Ser. No. 4,995
Claims priority, application France, Jan. 27, 1969, 6,901,529
Int. Cl. F16k *5/06*
U.S. Cl. 251—174 **6 Claims**



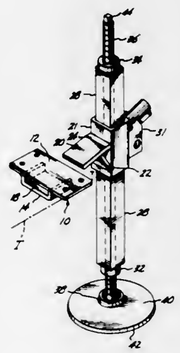
A cock comprising a body, a closure member displaceable within said body so as to establish or interrupt a communication between two orifices formed in opposite relation within said body and in the vicinity of each orifice a seal engaging said closure member. Each seal comprises a tubular ring of polytetrafluoroethylene which is engaged in a recess formed in the body and in fluidtight contact with a packing fitted in the wall of said recess; the tubular ring is provided with a deformable lip applied by a washer in fluidtight contact with the closure member. Owing to this arrangement, the polytetrafluoroethylene lip does not creep and the packing fitted in the wall of the recess is not caused to swell.

3,580,542
PUSHBUTTON VALVE
Allen C. Wright, Moraga, Calif., assignor to Haws Drinking Faucet Company, Berkeley, Calif.
Filed Sept. 5, 1969, Ser. No. 855,599
Int. Cl. F16k *1/10*
U.S. Cl. 251—282 **10 Claims**



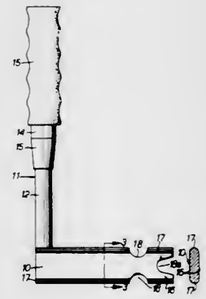
A pushbutton valve of the type used in drinking fountains to control the flow of water to the discharge nozzle thereof. The moveable control component of the valve assembly is isolated from unbalanced pressure forces and is therefore displaceable between the open and closed positions thereof with substantially the same manual force irrespective of the pressure of the water supply delivered to the fountain. The valve assembly includes a casing defining a cylinder having inlet and outlet passages and communicating therewith intermediate its ends and at laterally spaced locations. A control piston reciprocable within the cylinder is moveable between open and closed positions and is spring biased toward the closed position thereof. The piston has a valve chamber intermediate its ends within which is located a valve structure providing a pressurizable chamber and inlet and outlet ports opening thereinto and communicable with the inlet and outlet passages of the assembly when the control piston is in its open position. The valve structure is comprised of a plurality of individual components, and water pressure within the pressurizable chamber biases the valve components into slidably sealing engagement with the walls of the cylinder.

3,580,543
TRAILER JACK
Otto F. Hafeli, Rte. 4, Box 929, Port Angeles, Wash.
Filed Nov. 29, 1968, Ser. No. 782,509
Int. Cl. B66f *3/36*
U.S. Cl. 254—100 **4 Claims**



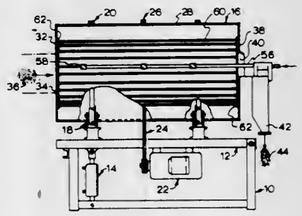
A generally rectangular bracket is secured to the underside of a trailer and provides a slot for receiving a tongue that is mounted on a slidable sleeve. The lower side of the bracket is shorter than the upper side to receive a brace that is welded between the sleeve and the brace so that the weight of the trailer is supported on the brace. The sleeve is adjustably mounted on an elongated frame and is locked in any desired position along the frame by a conventional pawl and detent mechanism. A nut is welded to the lower end of the elongated frame and a guide collar is welded to the top end. A threaded shaft extends through the collar and nut to position the elongated frame above the ground. The upper end of the threaded shaft is provided with a square head to be turned by a wrench or ratchet. The lower end of the shaft is rounded and rests in a cup formed integrally on a flat support plate.

3,580,544
TOOL FOR USE WITH DISC BRAKES
Arthur Albert Payne, Birmingham, England, assignor to Girling Limited,, Birmingham, England
Filed Nov. 7, 1968, Ser. No. 774,067
Claims priority, application Great Britain, Nov. 10, 1967, 51255/67
Int. Cl. B66f *3/00*
U.S. Cl. 254—131 **5 Claims**



A tool for pushing back a piston in a cylinder of a disc brake comprises a bar of substantial length. The opposed end edges of the bar are of outwardly convex section and the dimensions between these edges is greater than the thickness of the bar between opposed sides. The dimensions between the opposed end edges correspond to the distances between the disc of a disc brake and the inner end of the piston when the piston is fully retracted, and the distance between the sides of the bar is slightly less than the space between the piston and the disc left after removal of a friction pad assembly.

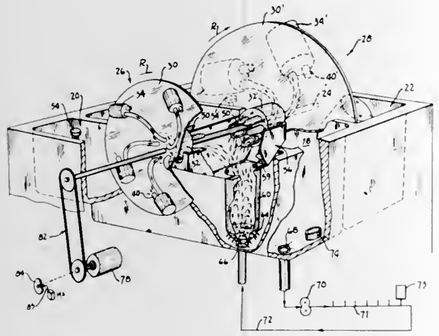
3,580,545
APPARATUS FOR AGGLOMERATING DUSTS AND THE LIKE
Edward D. O'Brien, Woodside, Calif., assignor to Stauffer Chemical Company, New York, N.Y.
Continuation-in-part of application Ser. No. 652,922, July 12, 1967, now abandoned. This application May 23, 1969, Ser. No. 858,213
Int. Cl. B01f *9/06*
U.S. Cl. 259—3 **10 Claims**



pparatus for agglomerating fine particles including a rotatable mixer, generally resembling a rotary drum dryer,

having optionally a conveyor, such as a spiral vane, as an aid in moving particulate base material therethrough, an applicator, such as a manifold with spray nozzles for applying a liquid or another solid particulate material to the base material and thereby effecting coating and agglomeration of the base material, and lifter elements mounted within the mixer and rotatable therewith adapted to move through the normally relatively dormant central region of the mass of base material and thereby cause the base material in this region to become mixed with the base material in the normally actively moving inner and outer regions of said mass.

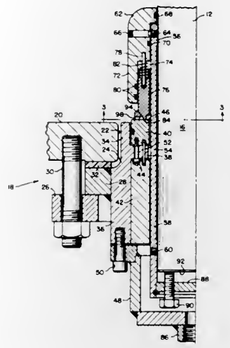
3,580,546
DEVICE FOR MIXING AND PROPORTIONING LIQUIDS
Colin Kenneth Glenn Fraser; Ernest Favreau, and Willis Paul March, Vancouver, British Columbia, Canada, assignors to Kaydon Technical Enterprises, Ltd., Vancouver, Canada
Filed Sept. 3, 1969, Ser. No. 854,888
Claims priority, application Canada, Sept. 5, 1968, 029,275
Int. Cl. B01f *15/04;* **G05d** *11/02*
U.S. Cl. 259—4 **23 Claims**



An apparatus for mixing and proportioning liquids includes a plurality of tanks for containing liquids to be mixed together. Each of the tanks has a bucket carrying assembly disposed therein, each such assembly being arranged for rotation to cause the buckets to successively enter into and emerge from the liquid contained in their respectively associated tank. The buckets are provided with means whereby each bucket is completely filled during each rotation cycle of each assembly. The buckets are also provided with means to effect discharge of the content of the buckets at a discharge region and a mixing device is provided to receive the discharged liquids and mix them together. The liquid capacities for buckets of each assembly are preselected to permit the several liquids to be mixed together in the desired proportions.

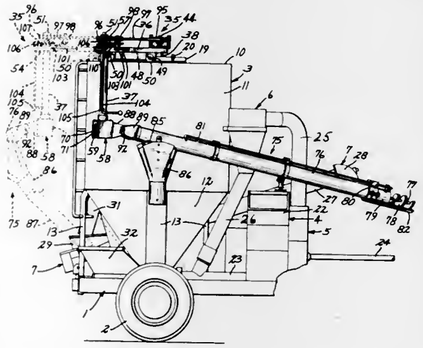
3,580,547
PACKAGE, LIQUID FLUSHED, STEADY BEARING ASSEMBLY
Franklyn J. Amorese, Hilton, N.Y., assignor to Sybron Corporation, Rochester, N.Y.
Filed June 13, 1969, Ser. No. 832,929
Int. Cl. B01f *7/20;* **F16c** *1/26*
U.S. Cl. 259—23 **10 Claims**

Disclosed is a liquid flushed, steady bearing assembly which can be mounted as a package to the exterior of a mixing vessel to support the free end of an agitator shaft protruding outwardly from the vessel so that the wear bearing of the assembly is serviceable from outside of the vessel. The flushing liquid is discharged radially from the assembly and into the vessel in a single stream from between a stationary member and a rotating member located within the vessel,



wherein the spacing between these members can be controlled in part from outside of the vessel.

3,580,548
CONVEYOR ATTACHMENT FOR PORTABLE FEED MILL
Carroll E. Moore, Minneapolis, Minn., assignor to Farmhand, Inc., Hopkins, Minn.
Filed May 16, 1969, Ser. No. 825,366
Int. Cl. B01f *5/12, 7/00*
U.S. Cl. 259—95 **7 Claims**

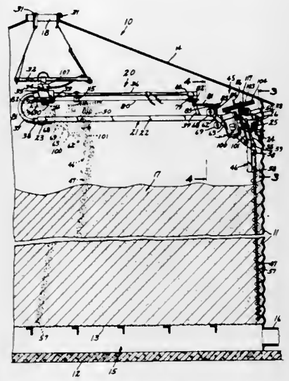


An attachment for mounting a feeding auger to the mixing tank of a portable feed mill for driving engagement with a rotary mixing device in the mixing tank, to convey material selectively to a plurality of inlets to the mixing tank, from various points of supply exterior of the tank. Supporting structure is rotatively mounted on the mixing tank and the feeding auger is operatively connected to the supporting structure for universal swinging movements relative to the supporting structure.

3,580,549
GRAIN STIRRING DEVICE
David M. Murphy, Mason City, Iowa, assignor to David Manufacturing Co., Mason City, Iowa
Filed July 31, 1969, Ser. No. 846,362
Int. Cl. B01f *7/00*
U.S. Cl. 259—102 **16 Claims**

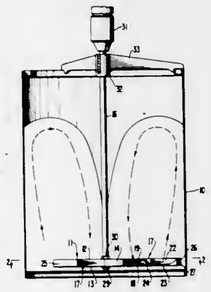
A device for stirring material in a cylindrical container and which includes a support means mounted within the container for orbital movements about the vertical axis thereof, a trolley means mounted on the support means for movements radially toward and away from the all of the container, and a stirring auger having the upper end thereof rotatably

mounted on an auger support means carried by the trolley means. The auger support means depends from the trolley means and extends laterally outwardly therefrom toward the wall of the container so as to position the auger in close proximity and substantially parallel to the wall of the container



when the trolley means is fully moved radially toward the wall of the container. Drive means is connected to move the support means in its orbital path of travel, to move the trolley means radially toward and away from the wall responsive to movement of the support means, and to rotate the stirring auger.

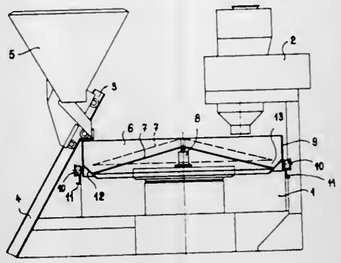
3,580,550
MIXING APPARATUS
Roy Hunnicutt, Box 9108, Amarillo, Tex.
Filed June 13, 1968, Ser. No. 736,729
Int. Cl. B01f *7/20*
U.S. Cl. 259—107 **3 Claims**



A bladed mixing rotor particularly for viscous liquids having plural radial blades projecting from a central hub. Each blade has a first recess in its lower surface adjacent the hub and a second recess in its top surface outwardly of the first recess. Two inclined pumping surfaces are thus formed on each blade, the pumping surfaces being reversely inclined.

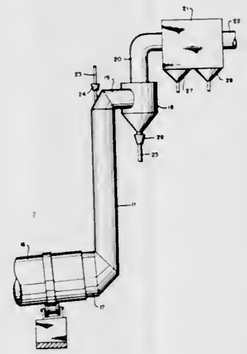
3,580,551
CONCRETE AND THE LIKE MIXER
Heinz Hammann, Speyerdorf, and Werner Dick, Eisingen, Germany, assignors to Lico A G, Glarus, Switzerland
Filed Aug. 14, 1969, Ser. No. 850,112
Claims priority, application Germany, Aug. 21, 1968, Nov. 8, 1968, G6,752,714; G6,805,948
Int. Cl. B28c *7/16*
U.S. Cl. 259—152 **10 Claims**

A concrete or the like mixer comprises an open-topped main mixing container and a premixer disposed above the main mixing container and having a circular bottom wall rotated about a vertical axis and normally frictionally engaging the lower part of a cylindrical sidewall forming a premixing container together with said bottom wall. In order to discharge the contents of the premixer into the main mixing container, the bottom and sidewalls of the premixer are tem-



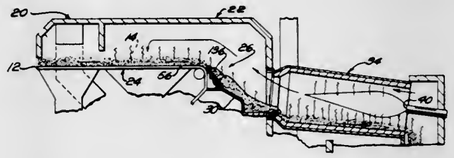
porarily disengaged, to provide a peripheral annular discharge passage.

3,580,552
STACK PREHEATER
Dan Sigurd Hansen, Copenhagen-Valby, Denmark, assignor to F. L. Smidth & Co., New York, N.Y.
Filed Apr. 9, 1969, Ser. No. 814,774
Claims priority, application Great Britain, Apr. 24, 1968, 19,440/68
Int. Cl. F27b *7/02;* **F26b** *17/00*
U.S. Cl. 263—32 **4 Claims**



A heat exchanger for preheating granular or pulverulent material especially when such material is fed to a rotary kiln. The preheater is in the form of an upright stack or tubular conduit within which means is fixedly mounted extending from the bottom to the top of the stack and providing guiding surfaces for the heating gas which flows upwardly through the stack, and for the granular or pulverulent material as it flows downwardly countercurrent to the gas flow.

3,580,553
GRATE STRIPPER FOR PELLETIZING MACHINE
Daniel M. Urich, Hibbing, Minn., assignor to Eveleth Taconite Company, Forbes, Minn.
Filed May 14, 1969, Ser. No. 824,397
Int. Cl. F27b *7/02*
U.S. Cl. 263—32 **7 Claims**



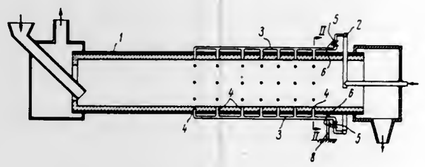
An improved pellet hardening machine or assembly includes a preheating section wherein pellets of iron ore are

preheated and an indurating section wherein the preheated pellets are heated to a desired hardness. A stripper assembly is provided for removing pellets from a conveyor on which they are transported. The stripper assembly is colled by a flow of air from a pump or other source of air under pressure. This air is discharged from the striper assembly in jets or streams which promote fluidization of relatively fine particles of material carried by the conveyor.

3,580,554
APPLIANCE FOR SUPPLYING GAS INTO A PREDETERMINED ZONE

Vladimir Pavlovich Bushuev, ul Mostovaya, 8, kv. 64; Georgy Viktorovich Gubin, ul Kharitonova, 8a,kv. 2; Petr Semenovich Zolotarev, ul Mostovaga, 18, kv.45; Vladimir Andreevich Sorokin, ul 23 Ljutogo, 26, kv. 26; Vladimir Ivanovich Palamarchuk, per Zhurnalistov, 8, kv. 21, and Viktor Makarovich Dmitrenko, ul Kropivnitskogo, 30, kv. 37, all of Krivoi Rog, U.S.S.R.

Filed Apr. 23, 1969, Ser. No. 818,611
Int. Cl. F27b *7/00*
U.S. Cl. 263—33 **3 Claims**

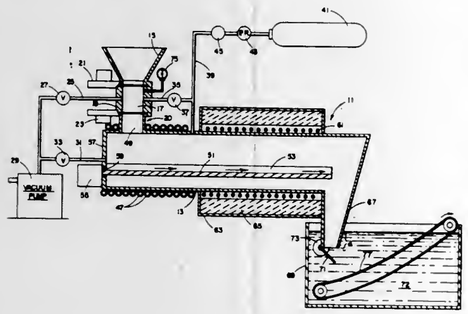


A device for supplying gas into a predetermined zone of a roasting kiln rotating about its longitudinal axis. The device includes an annular collector externally enclosing the kiln and secured thereon. The collector is connected to a gas line and branch pipes of the collector to burners disposed in rows along the kiln. Mounted on the branch pipes are shutoff devices. Provided in the plane of rotation of the shutoff devices are stops: one for opening the cocks disposed at the inlet of the burners of its row into the predetermined zone of the kiln, and the other for closing the cocks disposed at the outlet of the burners from the predetermined zone of the kiln.

3,580,555
METHOD AND DEVICE FOR HEAT TREATMENT OF METALS

Harlan G. Gearhart, La Canada, Calif., assignor to VST Corporation, Pasadena, Calif.

Filed May 6, 1968, Ser. No. 732,796
Int. Cl. C21d *1/66*
U.S. Cl. 266—4R **6 Claims**

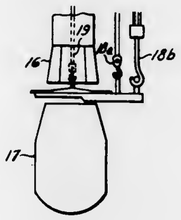


A furnace and resultant novel method for the heat treatment of metal parts, particularly of alloys containing titanium, comprising a heated retort maintained under continuous pressure by an inert gas with the retort feeding directly into a liquid quench bath. The parts are admitted to the furnace through a vacuum trap so that no air can enter the furnace to contaminate the material.

3,580,556
SAFETY SHIELD FOR A FUME-COLLECTING APPARATUS

John D. Roscoe, Baltimore, Md., assignor to Bethlehem Steel Corporation

Filed Apr. 18, 1968, Ser. No. 722,295
Int. Cl. F27d *21/00*
U.S. Cl. 266—16 **2 Claims**

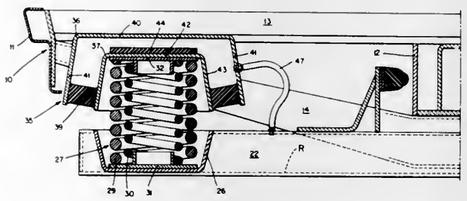


A safety shield placed and secured under a fume-collecting apparatus for a metallurgical furnace when the furnace is not operating, thereby preventing slag accumulated within and on the apparatus during furnace operation from falling upon workmen below. The shield may be placed under the apparatus by setting it on a rig, moving the rig under the apparatus, securing the shield under the apparatus, and subsequently removing the rig.

3,580,557
RAILWAY SPRING SUSPENSION

Albert G. Dean, Narberth, Pa., assignor to The Budd Company, Philadelphia, Pa.

Filed Jan. 30, 1969, Ser. No. 795,218
Int. Cl. B61f *5/04;* **F16f** *3/10, 13/00*
U.S. Cl. 267—3 **1 Claim**



Air spring apparatus consisting of two axially aligned cylinders connected by an elastomer ring which provides an air seal. The shear capacity of the ring is slight permitting relatively free axial movement between the cylinders but is substantially incompressible to compression loads to prevent relative lateral movement of the cylinders.

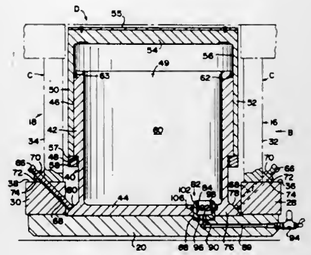
3,580,558
CUSHION MOUNTING IN PUNCH PRESS

Robert A. Helrigel, Hastings; James R. Brownell, Delton; Roderick K. Ward, and Harry E. Keithley, Hastings, Mich., assignors to E. W. Bliss Company, Canton, Ohio

Filed Jan. 8, 1969, Ser. No. 789,868
Int. Cl. F16k *9/31*
U.S. Cl. 267—114 **4 Claims**

A machine press bed assembly including an air cushion seated in the press bed, air input means integral with the press bed floor, aperture means in an end wall of the cushion

accommodating said air input means, and holddown means penetrating the press bed sides engaging the cushion, the

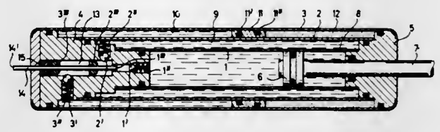


cushion being removable from said press bed by disengaging the holddown means.

3,580,559
HYDROPNEUMATIC PISTON-CYLINDER ARRANGEMENT

Rudolf Spieth, Plochingerstrasse 156, Esslingen, and Gunter Otto, Lindenstrasse 3, Altbach, Germany

Filed Nov. 13, 1968, Ser. No. 775,472
Claims priority, application Germany, Oct. 1, 1968, P1800020.9
Int. Cl. F16g *9/08*
U.S. Cl. 267—126 **11 Claims**



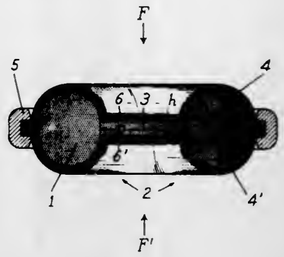
An improved hydropneumatic piston-cylinder arrangement, adapted to be blocked from the outside, with a fluid-filled and a gas-filled chamber, a piston mounted in the fluid-filled chamber with an externally projecting piston rod, wherein the chamber filled with fluid contains a fixed partition provided with passages for the fluid and the said passages are completely closing by blocking means adapted to be opened from the outside. The arrangement may be constructed as a tension spring or as a compression spring, wherein the compression spring construction is preferred for the lockable, stepless adjustment of table tops, driving seats and the like.

3,580,560
RESILIENT DEVICES

Jacques Jarret, Le Vesinet, and Jean Jarret, Fourqueux, France, assignors to Societe D'Exploitation Des Ressorts Auto-Amortisseurs Jarret, Paris, France

Filed Feb. 18, 1969, Ser. No. 800,227
Claims priority, application France, Feb. 19, 1968, 140,375
Int. Cl. F16f *1/37*
U.S. Cl. 267—153 **4 Claims**

This invention is concerned with a compression spring in which an elastomeric mass is confined in a chamber whose volume is variable without any sliding joint, the chamber in-

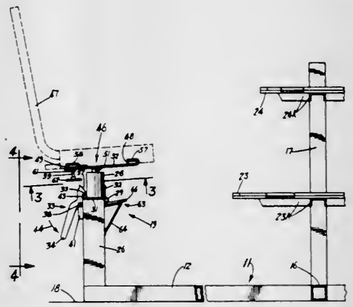


cluding a toric portion enclosing a cylindrical portion whose height is small compared to its diameter.

3,580,561
ARTICLE HOLDING APPARATUS

Reuben J. Krein, Forest City, Iowa, assignor to Stitchcraft Corporation, Forest City, Iowa

Filed Dec. 3, 1968, Ser. No. 780,707
Int. Cl. B25b *5/14*
U.S. Cl. 269—81 **13 Claims**



A jig for supporting a seat frame selectively in an upright position and in a horizontal position to facilitate mounting of backrest, cushion and covering on the seat frame. The jig has four spaced assembly stations each having an upright post pivotally carrying a support. Rotatably mounted on the support is a seat frame holder releasably attachable to a portion of the seat frame. A latch holds the support in an upright position. On release of the latch, the support can be pivoted into engagement with a stop to locate the seat in a generally horizontal position.

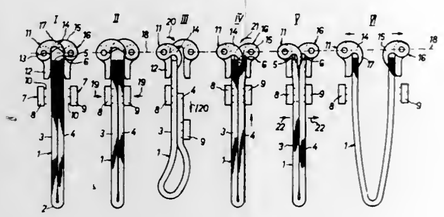
3,580,562
APPARATUS FOR OPENING FOLDED ARTICLES, SUCH AS NEWSPAPERS

Walter Reist, Hinwil, Switzerland, assignor to Ferag, Fehr & Reist AG, Hinwil, Zurich, Switzerland

Filed Jan. 29, 1969, Ser. No. 795,006
Claims priority, application Switzerland, Feb. 2, 1968, 1591/68
Int. Cl. B65h *39/02*
U.S. Cl. 270—54 **6 Claims**

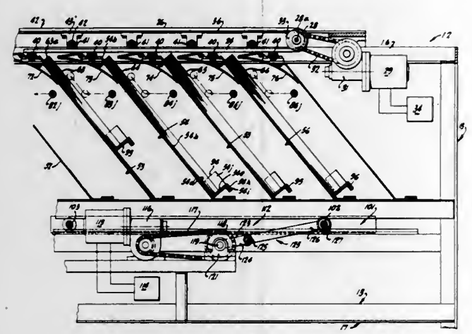
Apparatus for opening folded newspapers which arrive from a printing press in imbricated succession and are separated into single copies, comprises conveyor means to carry the folded copies along in spaced relation. Opposite gripping jaws are provided to grip the two folded halves of the newspapers and cause a sliding movement of the two halves relative to each other in a direction at right angles to

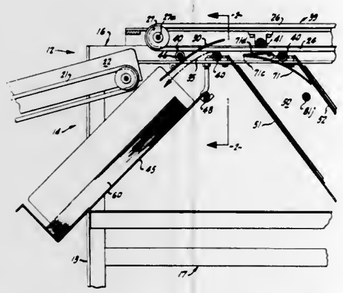
the fold to expose one edge portion of the folded newspaper while further gripping jaws grip the exposed edge portion and the edge portion of the other half of the folded newspaper. The gripping jaws are attached to endless conveyor means to



move along with the moving newspapers and are controlled to open the two halves of the newspapers, while further conveyor means supply enclosures or supplemental sheets to be slipped laterally into the opened newspapers.

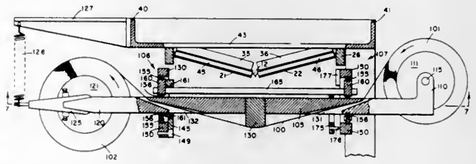
3,580,563
COLLATING MACHINE FEEDING INTO OR OUT OF RACKS
Ernest D. Bassett, Box 545, Santa Barbara, Calif.
Filed Jan. 30, 1969, Ser. No. 795,153
Int. Cl. B65h *39/02*
U.S. Cl. 270—58 **3 Claims**





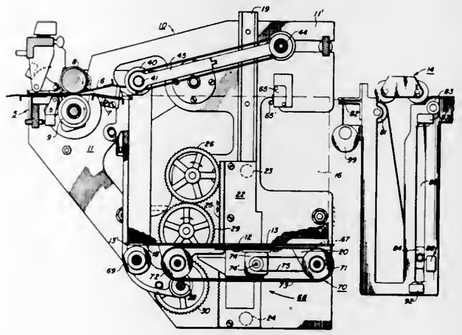
A horizontal elongated framework carries a plurality of transverse, inclined, parallel, paper-supporting racks. A conveying system on the machine, including a belt, transports sheets of paper emerging from a reproduction apparatus into predetermined ones of the racks. After the desired number of sheets have been placed in the racks in the appropriate sequence, various adjustments are made to the machine, including reversal of belt movement, enabling the machine to collate the sheets of paper previously assembled in the racks. The collating mechanism includes structure enabling the operator to adapt the machine to varying paper sizes, textures and weights.

3,580,564
FEEDING APPARATUS FOR NONRIGID SHEET
Ira D. Boynton, Lexington, and Willard G. Sylvester, Concord, both of, Mass., assignors to Apparel Research Foundation, Inc., Washington, D.C.
Filed Dec. 2, 1968, Ser. No. 780,397
Int. Cl. B65h *3/20*
U.S. Cl. 271—33 **5 Claims**



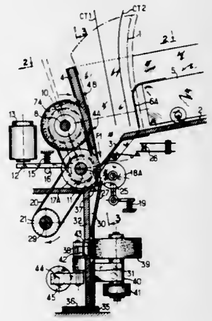
Apparatus for separating and delivering single sheets of a nonrigid material from a stack. The sheets in the stack are held in a slightly bent configuration and periodically a corner or peripheral area of the under surface of the bottom piece is exposed and pulled downwardly to allow horizontally movable separating means to move between the stack and the initially partially separated bottom piece to complete its separation, free it from the stack and permit it to drop by gravity.

3,580,565
SHEET FEEDING APPARATUS
Donald G. Mallory, Penfield, and Lyman H. Turner, Pittsford, assignors to Xerox Corporation, Rochester, N.Y.
Filed Dec. 11, 1968, Ser. No. 782,908
Int. Cl. B65h *3/06*
U.S. Cl. 271—39 **8 Claims**



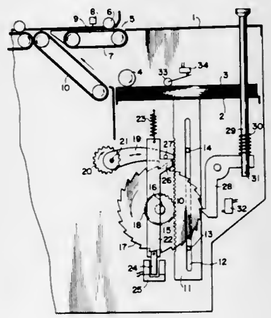
Sheet feeding apparatus incorporating a tray for storing precut sheets; first feeding means contactable with the topmost sheet of the precut sheet stock to feed precut sheets forward in seriatim; means to raise the tray to maintain the topmost sheet of the precut sheet stack in operative contact with the first feeding means as precut sheets are removed therefrom; second feeding means disposed under and jointly movable with the tray and cooperable with the base of the tray to form a passageway for feeding of ready cut sheets from a roll stock converter forward; and aperture means in the tray base enabling the first feeding means to drivingly contact the second feeding means when the tray is empty following raising of the tray to a maximum height.

3,580,566
ASYNCHRONOUSLY CONTROLLED ARRANGEMENT FOR FEEDING RECORD CARDS
Jacques Vasse, L'Hay les Roses, France, assignor to Societe Industriell Bull-General Electric, (Societe-Anonyme), Paris, France
Filed Apr. 14, 1969, Ser. No. 815,846
Claims priority, application France, Apr. 23, 1968, 149,082
Int. Cl. B65h *1/06*
U.S. Cl. 271—41 **4 Claims**



A card-feeding arrangement comprising a friction roller controlled by an electromagnet for advancing a card through a throat as far as driving rollers and a detector. A pulse generator receives a control pulse for feeding a card, transmits in response a first pulse to the electromagnet through a first switch and thereafter a signalling pulse through a second switch; the arrival of a card in the detector transmits a pulse which opens the switches and hence deenergizes the electromagnet and prevents the transmission of the signalling pulse.

3,580,567
AUTOMATIC ELEVATING MECHANISM FOR A PAPER FEED PLATFORM OF AN AUTOMATIC PAPER FEED DEVICE FOR USE WITH A PHOTOCOPYING MACHINE, PRINTING PRESS, OR THE LIKE
Hideo Hashimoto, Koshigaya-shi, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Aug. 27, 1968, Ser. No. 755,539
Claims priority, application Japan, Aug. 31, 1967, 42/55507
Int. Cl. B65h *1/18*
U.S. Cl. 271—62 **3 Claims**

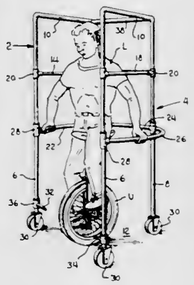


When the height of a stack of papers to be copied or printed falls below a predetermined level, the level of the stack is sensed by a sensing roller which closes the circuit for a solenoid through a microswitch attached to the sensing roller. A blocking plate is pulled downwardly by the solenoid and a constantly reciprocating engaging pawl is thereby allowed to engage a ratchet wheel, thereby moving upwardly a rack in mesh with a pinion integral with the ratchet wheel, whereby a paper feed platform supported by the rack can be elevated up to a predetermined level.

3,580,568
TIGHTROPE DEVICE
Guthrie B. Stone, Honeoye, N.Y.
Filed July 29, 1968, Ser. No. 748,353
Int. Cl. A63b *23/04*
U.S. Cl. 272—60 **4 Claims**

A stout rope is glued or otherwise fastened in a groove atop the upper edge of a support rail which is about 6 inches high and an inch more or less in cross section. The lower edge of the support rail is retentively but removably seated in keeper notches provided in upper edge portions of longitudinally spaced transverse footlike blocks.

3,580,569
TRAINING FRAME FOR USE IN LEARNING HOW TO RIDE A UNICYCLE OR WALK ON THE HANDS
Henry Allen Wilson, General Delivery, Miami Beach, Fla.
Filed Oct. 14, 1968, Ser. No. 767,336
Int. Cl. A63b *69/16*
U.S. Cl. 272—60 **2 Claims**

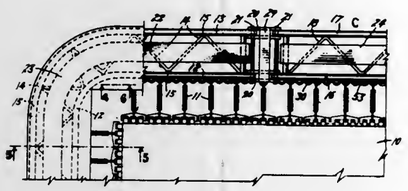


A unicycle training device in the form of a mobile frame open at the front to the supporting floor between vertical side rails that extend materially above the head of the learner when mounted on the seat of a unicycle between outwardly curved horizontal side rails which are adapted to be grasped by the hands of the learner, who must have freedom for balancing gyrations when so mounted prior to propelling the unicycle through the open front of said frame free of said rails and for other training in balancing free of said frame. The device comprises a pair of U-shaped members mounted on casters and secured together by parallel brackets. The lower bracket is an arc of a circle and spaced about hip high from the floor.

3,580,570
FOLDABLE TRAMPOLINE

Robert M. Fenner, and Donald E. Hamilton, Englewood, Colo.

Filed June 11, 1968, Ser. No. 736,043
Int. Cl. A63b *5/00*
U.S. Cl. 272—65 8 Claims

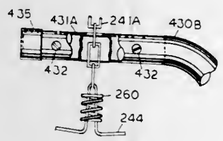


Two U-shpaed, trussed end frames hingedly connected together at their terminal extremities by straight, trussed side frames so that the end frames may be folded over the side frames for storage or opened out into the plane of the side frames to form an open, rectangular, peripheral bed frame which tensionally supports a conventional trampoline bed. Foldable leg elements hingedly mounted below said side frames for supporting the latter from the floor and foldable leg-bracing elements hingedly mounted below said end frames for maintaining said leg elements in the proper supporting positions, said frames being covered by cushioned deck pads which form a deck-way completely about said trampoline bed.

3,580,571
CHAIN SWING

Martin Green, Mahwah, N.J., assignor to Blazon, Inc., Jamestown, Pa. Division of Ser. No. 587,455, Oct. 18, 1966, abandoned.

Filed Jan. 27, 1969, Ser. No. 798,575
Int. Cl. A63f *7/06*; A47c *15/00*; A47d *13/10*
U.S. Cl. 272—85 3 Claims

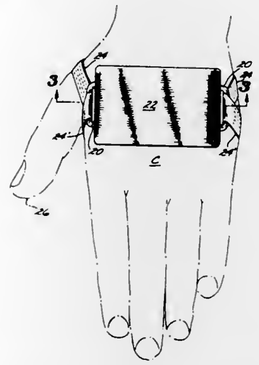


A chain swing for an outdoor amusement device having four chains supporting a bar, curved seats which are held apart by spacebars and held fast to the chains by spring pin arrangements, the spring pin arrangements including springs interposed between the bottom of the spacebar and extensions or wings of the spring pin arrangement for resilient cushioning of said seats.

3,580,572
BOWLER'S EQUALIZING WEIGHT

Richard A. Strafford, 7200 Cerritos Ave. Apt. A, Stanton, Calif., and William J. Davis, 8652 San Carlos Ave., Stanton, Calif.

Filed Nov. 13, 1968, Ser. No. 775,409
Int. Cl. A63b *71/14*
U.S. Cl. 273—54 1 Claim

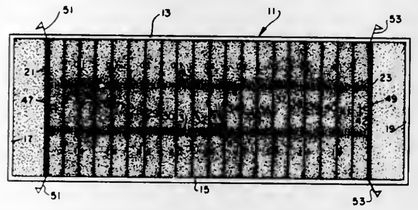


An equalizing weight of elongate arcuate configuration that substantially conforms to the exterior surface of the hand or wrist, and may be removably secured thereto to improve the performance of the bowler using the same.

3,580,573
FOOTBALL FIELD AREA IDENTIFICATION MEANS

Michael F. Noonan, 136 Church St., Plymouth, Pa., and James J. Fisher, 11 Franklin St., Larksville, Pa.

Filed Apr. 22, 1968, Ser. No. 723,355
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 10 Claims



The present application discloses a standard-sized, rectangular football playing field characterized by the fact that it is marked off by parallel, transverse lines spaced every five yards between a pair of transverse goal lines spaced 100 yards apart. Normally, these transverse lines, called yard lines, are colored white, as are the parallel, longitudinal lines which extend the full length of the playing field and define its lateral boundaries; however, in the present disclosure, certain of the transverse lines, which preferably include the goal lines, the midfield or 50-yard line and each of the six transverse yard lines nearest each of the goal lines are colored other than white to distinguish these lines, and the zones defined thereby, from other lines and zones on the field.

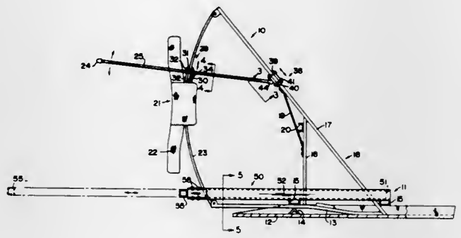
3,580,574
FOOTBALL BLOCKING SLED

John C. Hornak, 617 Blossom Drive, and Douglas F. Thompson, 2329 "G" St., Lorain, Ohio

Filed Apr. 18, 1969, Ser. No. 817,341
Int. Cl. A63b *67/00*
U.S. Cl. 273—55 10 Claims

Means are disclosed for limiting the height at which a football player may strike the contact pad on a blocking sled of

the type comprising a base, a support and a resilient member. The height-limiting means include a generally horizontally extending interference member capable of being positioned at a location spaced from the contact pad and at a predetermined height from the ground, and means for securing that member to the training sled so that the horizontal member effectively limits the height at which the player may contact

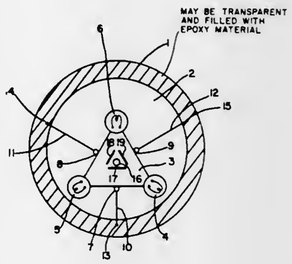


the sled. The member may be pivoted to a neutral position when not in use. A second feature of the invention includes means for causing the player to maintain his feet at least a predetermined distance apart during his line charge. The stance-extending means includes a telescoping member having a predetermined width. Both the height-limiting means and the stance-extending means may be attached to existing training sleds, or may be integrally built into new sleds.

3,580,575
GAME DEVICE INCLUDING SELECTIVELY IMPACT OPERABLE LIGHTS

Sheridan D. Speeth, Buffalo, N.Y., assignor to Autotelic Industries Limited, Fort Erie, Ontario, Canada

Filed Sept. 27, 1967, Ser. No. 670,875
Claims priority, application Canada, Aug. 28, 1967, 998,855
Int. Cl. A63b *43/06*; A63h *33/26*
U.S. Cl. 273—58 14 Claims



An impact toy, such as a ball, capable of withstanding an impact and having three different colored lamps supported within the interior of the toy. A switch device having a movable contact and three fixed contacts each associated with a different colored lamp is provided in an electrical circuit so that when the toy is subject to an impact, the movable contact touches a fixed contact to cause one lamp to be illuminated. The selected fixed contact is dependent on the point of impact. In alternative embodiments, the lamps may be embedded in the wall of the ball or within a transparent epoxy resin material filling the interior of the ball. The impact toy may take the form of a punching toy simulating a human figure, include audible signalling devices and electrical circuits including transistors and capacitor-resistor networks.

3,580,576
BILLIARD CUE AND REPLACEABLE CUE TIP ASSEMBLY

Anthony Merola, Pittsburgh, Pa., assignor to Amerola Products Corporation, Pittsburgh, Pa.

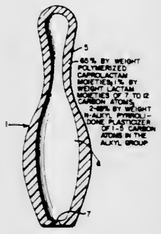
Filed Apr. 30, 1968, Ser. No. 725,450
Int. Cl. A63d *15/12*
U.S. Cl. 273—70 6 Claims

A billiard cue having a ferrule secured to one end. The ferrule detachably receives a cue tip. In one embodiment, the ferrule is of aluminum and has a knurled stud at one end received in a bore in the end of the cue stick. The cue tip has a body of vulcanized fibrous material and a tip of leather. One end of the tip body has a tapered frustoconical portion frictionally fitting a bore in the ferrule. The other end of the tip body is bonded to the leather tip.

3,580,577
COPOLYLACTAM BOWLING PIN

Thomas J. Hyde, Woodbury, and Leonard A. Targonski, Pennsville, N.J., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 9, 1968, Ser. No. 727,793
Int. Cl. A63d *9/00*
U.S. Cl. 273—82 8 Claims

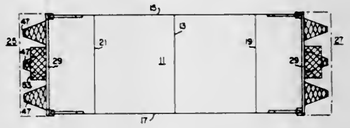


A bowling pin comprising a hollow elongated body made of a copolylactam composition containing at least 65 percent by weight polymerized caprolactam moieties, at least 1 percent by weight polymerized lactam moieties having from seven to 12 carbon atoms and N-alkyl pyrrolidone.

3,580,578
BOUNCING BALL GAME METHOD

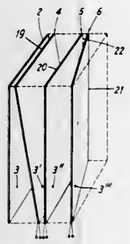
James B. McCarthy, Verona, Pa., assignor to Game Innovations, Inc., Verona, Pa.

Filed June 9, 1969, Ser. No. 831,630
Int. Cl. A63b *63/00*
U.S. Cl. 273—95R 1 Claim



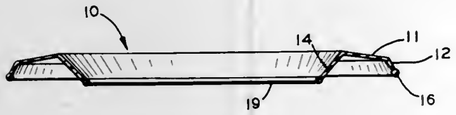
Apparatus for playing a court game with a resilient ball is disclosed which includes a court divided into sections for opposing players having dividing lines and foul lines. At the end of each section there is a vertical plate or panel having a plurality of holes or goals each covered by a net. The object of the game is to bounce the ball into a goal at the opposite end. The goals are placed and shaped so as to require different degrees of skill for scoring and are assigned correspondingly different score points.

3,580,579
ELECTRIC TARGET APPARATUS FOR INDICATING HIT POINTS
Armin Scharz, and Oskar Scharz, Interlaken Bern, Switzerland, assignors to Polytronic S. A., Saint-Aubin (Neuchatel), Switzerland
Filed Feb. 21, 1969, Ser. No. 792,340
Claims priority, application Switzerland, Jan. 19, 1968, 861/68
Int. Cl. F41j *5/04*
U.S. Cl. 273—102.2A **12 Claims**



A target apparatus for automatically indicating the hit point of a projectile comprises a plurality of target elements mounted one behind the other, each element including two electrically insulated parallel sheets of electrically conductive material and included in an electric circuit, the distance between the two conductive sheets being less than the length of a projectile. At least two of the target elements are situated in planes which are inclined one relative to the other, whereby said relatively inclined target elements, when traversed by a projectile, produce pulses in timed sequence which are used to determine the hit point of the projectile on the target.

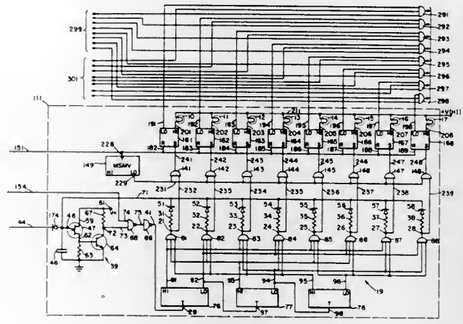
3,580,580
AERIAL SPINNING DISC
John D. Wark, 326 W. Lena Ave., Freeport, and Peter Schladermundt, 8 Park Ave., Bronxville, N.Y.
Filed Sept. 24, 1969, Ser. No. 860,485
Int. Cl. A63b *65/10;* **A63h** *27/00*
U.S. Cl. 273—106 **4 Claims**



A spinning aerial device or "flying saucer". It is a disc with a centered circular opening and has a plurality of concentric sections including an annular body section with downwardly extending flanges formed along the inner and outer edges of said body section.

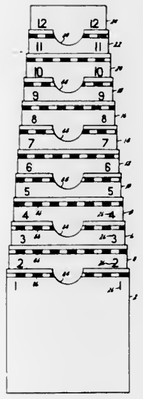
3,580,581
PROBABILITY-GENERATING SYSTEM AND GAME FOR USE THEREWITH
Richard C. Raven, Reno, Nev., assignor to Raven Electronics Corporation
Filed Dec. 26, 1968, Ser. No. 787,146
Int. Cl. A63b *71/06*
U.S. Cl. 273—138A **13 Claims**

In order to select an event at random from a set of possible events, wherein each event has a preselected and different probability of being selected, an electrical circuit is provided for generating a continuous cyclic succession of electrical output signals each corresponding to one event in which the time duration of each signal is individually controlled and preset to provide a different time portion of the total combined time duration of all of the output signals and means are provided for interrupting this continuous train of output signals at an arbitrary point in time, whereby the output signal occurring at the time of this interruption is sensed and



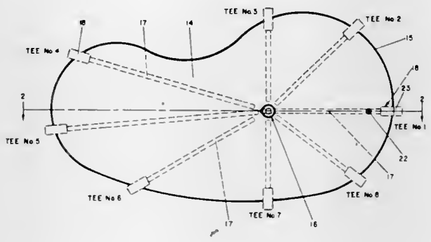
the event associated therewith is accordingly selected. Furthermore, a series of these circuits is disclosed in combination with a set of visual monitors for symbolically displaying the selection of events to provide a game for amusement and entertainment in which each event and combinations thereof is assigned a winning or losing value.

3,580,582
BOX GAME
Constantine P. Calamvotsakis, 1706 Brush Creek Blvd., Kansas City, Mo.
Filed Apr. 16, 1969, Ser. No. 816,756
Int. Cl. A63f *9/00*
U.S. Cl. 273—139 **3 Claims**



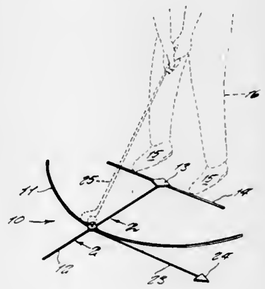
A box game for selecting a winner from a group of players, or for designating one person from the group to pay a "party penalty," by means of a process and apparatus involving chance and a high degree of interest and suspense, the apparatus consisting of a series of nested and numbered boxes adapted to be removed one at a time in turn by the players, whereby eventually to disclose a "token piece" concealed between any two successive boxes, and a set of dice adapted to be rolled by a nonplaying "dealer," who then places the token in accordance with the roll of the dice and assembles the boxes preparatory to play. The players may preselect and record the number of the box in which they believe the token to be concealed.

3,580,583
PUTTING GREEN INCLUDING MEANS FOR SEQUENTIALLY RETURNING HOLED-OUT BALLS TO PERIPHERALLY SPACED BALL DISPENSERS
Joseph A. Gentiluomo, 1456 Belmont Ave., Schenectady, N.Y.
Continuation of application Ser. No. 550,664, May 17, 1966. This application Jan. 21, 1969, Ser. No. 796,284
Int. Cl. A63b *67/02*
U.S. Cl. 273—176 **6 Claims**



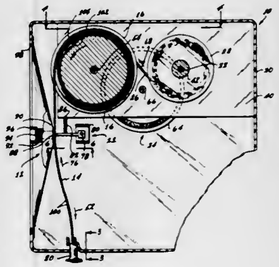
A continuous putting green surface having a cup, undulations, and surface texture similar to a golf course putting green, thereby, providing players with varied length putts in which the ball line-of-roll may envolve level, uphill, downhill, or sidehill travel or any combination thereof, either against, across, or with the grain of the putting surface or any grain combination thereof. Utilization of automatic ball-dispensing and ball return means eliminates player bending or stooping for balls both at the putting tees and at the cup. When the ball-dispensing means releases a ball upon the putting green, the ball return means is translated into ball-receiving position underneath the cup. A holed out ball will enter the ball return means and roll by gravity to the ball-dispensing means for subsequent reuse. This returned ball will initiate operation of a second ball-dispensing means to discharge a ball and cause the previously used ball return means to retract, and the ball return means associated with the second dispensing means to move into ball-receiving position underneath the cup. This sequence of operations will continue until balls are putted and holed out from the plurality of putting tee positions located on the putting green periphery.

3,580,584
GOLF PRACTICE DEVICE
David P. Trosko, San Francisco, Calif. (Pacific Architects & Engineers, Inc., Employee #1-02661, APO San Francisco, Calif. 96307)
Filed Mar. 10, 1969, Ser. No. 805,420
Int. Cl. A63b *69/36, 57/00*
U.S. Cl. 273—186 **1 Claim**



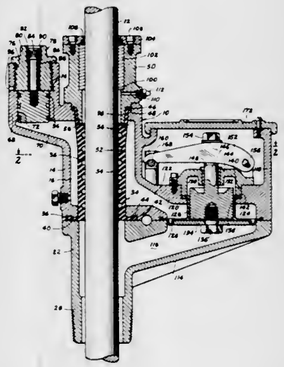
A practice device for golfers for teaching the basic principles of driving, the device comprising a flexible rope or chord for defining an arc of travel for a golf club head, a cross rod for defining the position of the player's feet, a forward extending rod extending from the cross rod a plastic cup upon which a golf ball is supported, and a straight bar extending from the plastic cup into the direction toward the green.

3,580,585
DEVICE FOR REPRODUCING SOUNDS IN TOYS
Edwin O. Stastny, Santa Ana; Lester T. Stormon, Redondo Beach, and Anson Sims, Manhattan Beach, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Continuation of application Ser. No. 716,543, Mar. 27, 1968, now abandoned. This application Nov. 26, 1969, Ser. No. 873,742
Int. Cl. G11b *3/00*
U.S. Cl. 274—1A **3 Claims**



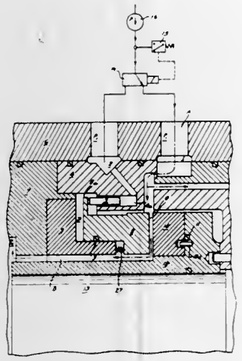
A sound-producing tape is wound on a reel having a spring-driven rewind. As the tape is pulled from the reel past a sound reproducer and a pivoted finger, the finger is pivoted due to its frictional engagement with the tape allowing the tape to inoperatively pass the sound reproducer. Upon release, the tape is automatically rewound onto the reel and is brought into operative association with the sound reproducer by the pivoted finger so that sounds are reproduced only during the rewinding operation.

3,580,586
INFLATABLE PACKING FOR STUFFING BOXES
Alvin G. Burns, 1020 E. 34th St., and Sheldon M. Miller, 4636 S. Wheeling, Tulsa, Okla.
Continuation-in-part of application Ser. No. 633,664, Apr. 12, 1967, now Patent No. 3,471,156. This application Oct. 3, 1969, Ser. No. 863,588
Int. Cl. F16j *15/40, 15/00, 9/00*
U.S. Cl. 277—3 **4 Claims**



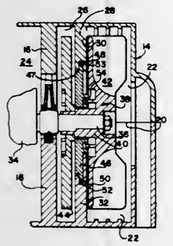
An inflatable packing gland for stuffing boxes utilized around the reciprocal polished rod of a producing oil well wherein the pressure of the packing member against the outer periphery of the polished rod may be automatically maintained at the most desirable level regardless of wear on the inner periphery of the stuffing gland.

3,580,587
CONTACT-FREE HYDROSTATIC SEAL
Dieter Born, Hessheim; Peter Stech, and Werner Huebner, Roxheim, Germany, assignors to Klein, Schanzlin & Becker A.G., Frankenthal, Pfalz, Germany
Filed Jan. 31, 1968, Ser. No. 702,001
Claims priority, application Germany, July 22, 1967, Aug. 11, 1967, DK62907;DK63081
Int. Cl. F16j *15/00;* **F16i** *17/00*
U.S. Cl. 277—3 **3 Claims**



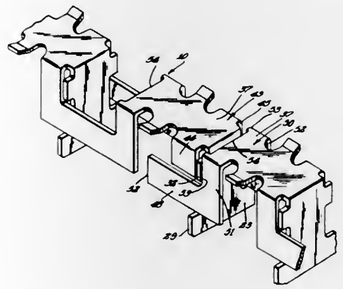
A contact-free hydrostatic seal wherein a rotary first annular sealing element defines with a second annular sealing element a gap for leak fluid. The second sealing element is biased toward the first sealing element by closing springs which tend to reduce the width of the gap. A pump delivers fluid into the gap to oppose the action of closing springs and to prevent direct contact between the sealing elements. When the pressure of fluid drops to such an extent that it can be overcome by the bias of closing springs, a safety device becomes operative to oppose such bias and to hold the second sealing element away from the first sealing element. The safety device includes a set of plungers which are subjected to fluid pressure and engage the second sealing element when the pressure of fluid in the gap drops to a certain minimum permissible value, or a lever which is pivoted into engagement with the second sealing element by one or more strong springs when such strong spring or springs overcome the fluid pressure at a time when the fluid pressure is too low to prevent the closing springs from moving the second sealing element into frictional engagement with the first sealing element.

3,580,588
MOTOR-PUMP SHAFT SEAL
Howard L. Allen, and Charles D. De Graff, North Canton, Ohio, assignors to The Hoover Company, North Canton, Ohio
Filed May 22, 1969, Ser. No. 826,798
Int. Cl. F16j *9/00, 15/00*
U.S. Cl. 277—32 **5 Claims**



An integral motor-pump of a wet pickup floor conditioner has a housing comprising pump and motor chambers. The housing is generally divided along a plane forming two housing sections each having an integral web portion extending between the pump and motor chamber portions therein. When the housing sections are assembled the mating web portions define a barrier wall having an aperture through which an output shaft, from a motor mounted in the motor chamber, extends. A groove is formed in the planar mating surface of each of the housing sections around the pump chamber. The grooves in the mating surfaces are each connected at their ends by a groove portion in the periphery or boundary edge of the opening in the respective web. A substantially continuous elastomeric sealing means is fitted in each groove. An impeller-fan unit, rotatably carrying a sealing disc between a motor-cooling fan and a pump impeller is mounted on the motor shaft. When assembled in the housing the impeller is located in the pump chamber and the motor-cooling fan located in the motor chamber, with the sealing disc extending into the groove portions in the periphery of the aperture in the barrier wall, in contact with the elastomeric seal therein. The disc is generally circular in shape with diametrically opposed tapered extensions mating with complementary-shaped groove portions at the intersections of the aperture and the adjacent planar mating surfaces of the web. A generally circular, axially offset, portion of the disc lies within the circular aperture and has a pair of diametrically opposed ears. Each ear has a flat, the flats lying flush against planar surfaces of the web of one of the housing sections adjacent the aperture. Arcuate opposing surfaces on the ears cooperate with camming cutouts in the internal web of the other housing section at the intersection of the planar mating surfaces and the central aperture to center the sealing disc in the aperture in the barrier wall.

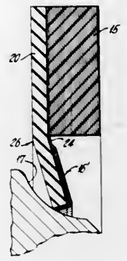
3,580,589
CIRCUMFERENTIALLY EXPANDING OIL CONTROL RING
Herbert F. Prasse, Town and Country, and Loyd D. Hensley, Creve Coeur, Mo., assignors to Ramsey Corporation, St. Louis, Mo.
Filed May 31, 1968, Ser. No. 733,661
Int. Cl. F02f *5/00;* **F16j** *9/00*
U.S. Cl. 277—140 **14 Claims**



A circumferentially expanding ring for spacing and expanding rail rings in a piston ring groove which ring has a plurality of integrally connected circumferentially spaced sections having upper and lower U-shaped lands integrally connected by axially upstanding lands and tongues projecting from some of the axially upstanding lands between the U-shaped lands to reinforce the upper and lower lands against collapse and/or to provide rail ring supports.

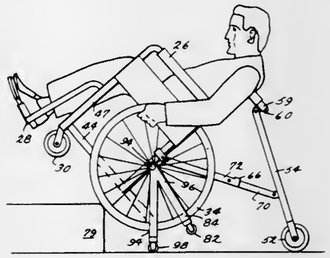
3,580,590
BEARING SEAL CONSTRUCTION
John F. Zotter, Southington, Conn., assignor to Textron Inc., Providence R.I.
Filed Nov. 7, 1969, Ser. No. 874,927
Int. Cl. F16j *15/32*
U.S. Cl. 277—227 **5 Claims**

The invention contemplates a laminated seal construction and method utilizing a flat annular sheet of flexible material, such as elastomeric material, laminated to a backing material, which at an axially thick portion defines a body, and which at an axially thin portion defines a seal member to be axially resilient deflected with respect to the body. The method of the invention calls for removing backing material after the laminating step, the removed material affording a



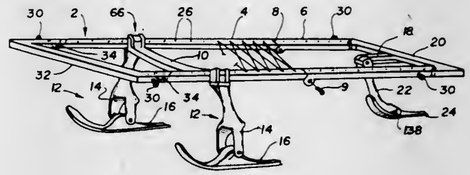
remainder which meets all requirements as to concentricity, circumferential uniformity of action, and the like. The material-removing step may be so characterized as to provide a local region for axial flexure, radially spaced from the region of wiping contact with the bearing ring to which it is sealingly engaged.

3,580,591
WHEELCHAIR ATTACHMENT
H. Franklin Coffey, Albuquerque, and Samuel T. Powers, Tijeras, both of, N. Mex., assignors to Lovelace Foundation for Medical Education and Research, Albuquerque, N. Mex.
Filed Dec. 24, 1968, Ser. No. 786,695
Int. Cl. B62b *5/02*
U.S. Cl. 280—5.32 **26 Claims**



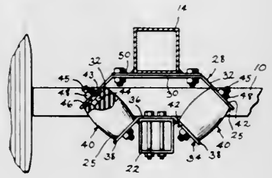
Wheelchair attachments, ordinarily installed in pairs, for enabling patients confined to wheelchairs to easily negotiate obstacles, such as curbs, in a conventional wheelchair having two small front wheels and two large rear wheels which the patient manually rotates to propel and maneuver the wheelchair. Each attachment includes an elevating member attachable to an axle of one of large rear wheels and having one or more prongs extending for a distance greater than the distance from the point at which the elevating member is attached to the wheelchair to the ground so that to mount a curb or similar obstacle the wheelchair can be made to stand on the elevating member with the large wheels elevated above the ground and against the curb or obstacle. The large wheels can then be manually rotated while against the curb to cause the wheelchair to climb the curb. The attachments of the invention must be used with a second attachment which includes an extendible wheel, or dolly, which is connectable to the wheelchair through supporting members and which can be manually extended backwards by the patient to a locked position. When both dollies of a pair of attachments are in this extended and locked position, the wheelchair can be tilted backwards manually to rest in a stable, tilted position on the two large wheels and the extended dollies or wheels with the two small front wheels, or casters, elevated. Curbs and other obstacles can then be simply negotiated in this tilted position by manually rotating the two large wheels so as to cause the wheelchair to stand on the pair of elevating members and then to climb the obstacle.

3,580,592
COMBINATION DEER-CARCASS SLED AND CHAISE LOUNGE
Eugene E. Schrecengost, R.D. #1, Box 65, Apollo, Pa.
Filed Jan. 23, 1969, Ser. No. 793,469
Int. Cl. B62b *13/16, 13/18*
U.S. Cl. 280—8 **5 Claims**



A deer-carcass sled is provided that folds and may conveniently be strapped to a hunter's back. It has ground-contacting members that comprise runners and/or tires, and are preferably capable of being turned into an inoperative position to afford a compact structure. The structure further comprises a back member that attaches to the sled or dolly to convert it into a chaise lounge.

3,580,593
ANTISWAY SUSPENSION SYSTEM FOR AN AXLED VEHICLE
Lynn H. Sprunger, P.O. Box 78, Albion, Ind.
Filed Apr. 14, 1969, Ser. No. 815,575
Int. Cl. B60g *9/00*
U.S. Cl. 280—124 **6 Claims**

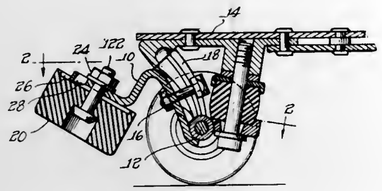


A suspension system having antisway properties for an axled vehicle. The vehicle includes a frame having a pair of spaced longitudinal members. A rigid elongated support member is spaced below and substantially parallel to each longitudinal frame member. A transverse axle is positioned below the longitudinal frame members and is secured to each support member intermediate the end portions thereof. A suspension unit is carried by each support member end portion and serves to interconnect the adjacent overlying longitudinal frame member with the support member. Each suspension unit includes upper and lower spaced brackets secured to the longitudinal frame and support members respectively and interconnected by resilient means which transmit the vehicle load to the axle.

3,580,594
TOE STOP MOUNTING FOR ROLLER SKATES
Gordon K. Ware, St. Charles, Ill., assignor to The Chicago Roller Skate Company, Chicago, Ill.
Filed May 20, 1969, Ser. No. 826,215
Int. Cl. A63c *17/14*
U.S. Cl. 280—11.2 **1 Claim**

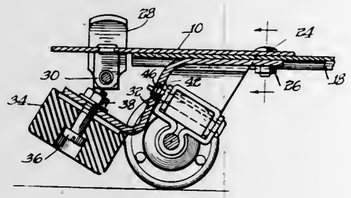
A toe stop mounting in which a rib or detent projects downwardly from the toe stop support for interlocking en-

gagement with one of a plurality of grooves formed in the upper end of the toe stop member to oppose rotation of the toe stop member in response to offcenter frictional braking



forces developed thereby. The bottom of the detent is fractured in an irregular manner to increase its holding power with respect to such rotation of the toe stop member.

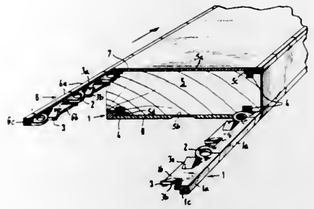
3,580,595
TOE STOP MOUNTING FOR STREET ROLLER SKATES
Gordon K. Ware, St. Charles, Ill., assignor to The Chicago Roller Skate Company, Chicago, Ill.
Filed June 4, 1969, Ser. No. 830,351
Int. Cl. A63c *17/14*
U.S. Cl. 280—11.2 **5 Claims**



A toe stop mounting for the type of street roller skates that contain a channel-shaped soleplate, a flat toeplate attached to the top of the soleplate, a toe clamp assembly attached to the bottom of the toeplate, and a front roller truck assembly attached to the bottom of the toeplate. The toe stop mounting includes an elongated strap of rigid material which is attached to the bottom of the channel-shaped soleplate between the side edges thereof and which is shaped to depend downwardly from the soleplate in front of the front roller truck assembly and then to extend upwardly toward the front end of the toeplate. A resilient toe stop member is attached to the bottom surface of the elongated strap in the upwardly extending region thereof. The strap is approximately equal in width to the inside dimension of the channel-shaped soleplate so that it receives lateral support from the side edges of the soleplate and is shaped so as to make contact with the front portion of the front roller truck assembly and toe clamp assembly for support purposes.

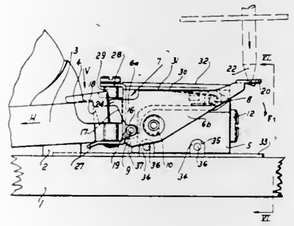
3,580,596
SKI CONSTRUCTION
Franz Volkl, Straubing, Lower Bavaria, Germany, assignor to Franz Volkl, OHG, Straubing Lower Bavaria, Germany
Filed Feb. 25, 1969, Ser. No. 801,956
Claims priority, application Germany, Feb. 27, 1968, P1,678,299
Int. Cl. A63c *5/04*
U.S. Cl. 280—11.13 **20 Claims**

An edge strip for a ski is formed of a plurality of separate segments interconnected by bridge pieces which extend, at least for a portion of their length, in a direction transverse to the longitudinal direction of the strip. The individual segments are fixed to the ski by means of tabs fitted into grooves



in the body of the ski and the tabs are held within the grooves by an adhesive material.

3,580,597
HEEL DOWNHOLDER FOR SAFETY SKI BINDINGS
Jean Joseph Alfred Beyl, 1, rue Devieur Robelin, Nevers, France
Filed Mar. 18, 1969, Ser. No. 808,112
Claims priority, application France, Mar. 22, 1968, 144,577
Int. Cl. A63c *9/00*
U.S. Cl. 280—11.35T **7 Claims**



A base member is adapted to be fixed with respect to the top surface of a ski. A pivoting member is mounted on the base member about a first transverse pivot pin. A jaw adapted to grip the heel of the ski boot is carried by the pivoting member. A cam following pin is carried by the pivoting member. A third transverse pivot pin is rotatably mounted on the base member. A pivoting lever is rigid with the third transverse pivot pin. A cam member for controlling the movement of the cam following pin from a first to a second position with respect to the cam member is carried by the pivoting lever. The downholder is at a lowermost position when the cam following pin is at its first position. The pivoting lever is adapted to constitute a release lever for controlling the retraction of the cam member. The third rotary transverse pivot pin has a planar abutment surface including a pair of edges parallel to each other and to the axis of the third pivot pin. A piston having a complementary planar surface is adapted to contact the abutment surface. The plane containing the abutment surface is perpendicular to the axis of the piston when the downholder is in its lowermost position. A compression spring urges the piston against said edges.

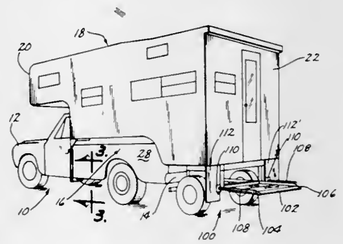
3,580,598
TOBOGGAN
Robert C. de Pauw, 18 Edgewood Hills, East Peoria, Ill.
Filed Apr. 21, 1969, Ser. No. 817,763
Int. Cl. B62b *13/00*
U.S. Cl. 280—18 **22 Claims**

A steerable toboggan having a transversely curved body

with longitudinal corrugations and steering ribs along each side. The steering ribs are deeper and narrower than the cor-

rugations, and are curved with wider spacing at the front than at the rear.

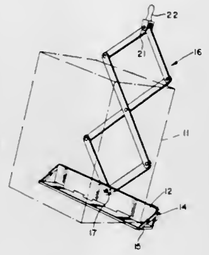
3,580,599
JACK AND TIEDOWN SYSTEM FOR A VEHICLE MOUNTED CAMPER
John N. Dodgen, and Kenneth R. Johnson, Humboldt, Iowa, assignors to Dodgen Industries, Inc., Humboldt, Iowa
Filed May 2, 1969, Ser. No. 821,183
Int. Cl. B62d *21/14;* **B60p** *3/32*
U.S. Cl. 280—34 **10 Claims**



A jack and tiedown system for a vehicle mounted camper including a first pair of jacks secured to the lower front corners of the camper and a second pair of jacks secured to the rearward end of the camper. The front jacks are adapted to be lowered into ground engagement at times to support the front end of the camper while the rear jacks are adapted to be lowered to the ground to support the rearward end of the camper at times. The vehicle has a pair of brackets secured to its frame which extends outwardly therefrom at opposite sides thereof and which are adapted to have the lower ends of the first pair of jacks connected thereto to tiedown the camper to the vehicle when the jacks are not being used to support the camper. The rear jacks are pivotally connected to the camper and are positioned rearwardly of the camper mud flaps to prevent the flaps from flapping in the wind when the second pair of jacks are not being used to support the rearward ends of the camper.

3,580,600
COLLAPSIBLE HANDTRUCK
Harry B. Caplin, 60 Copperfield Road, Worcester, Mass.
Filed May 7, 1969, Ser. No. 822,588
Int. Cl. B62b *1/04*
U.S. Cl. 280—36 **3 Claims**

A collapsible handtruck comprises an upwardly extending baseplate to which a lower baseplate is hinged to form a support of generally L-shaped cross section. A pair of wheels are attached to the upwardly extending baseplate. A pantographic member, of the lazy tongs type, has its lower point attached to the center of the upper edge of the upwardly ex-

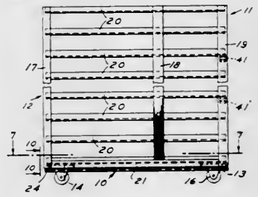


tending baseplate and a handle attached to the upper point. The resulting structure may then be collapsed into a compact bundle for easy storage in the trunk of an automobile.

3,580,601
SKATE DEVICE FOR TRANSPORTING LARGE OBJECTS
Ray P. Miles, 8575 W. Melody Lane, Macedonia, Ohio
Filed Apr. 30, 1969, Ser. No. 820,574
Int. Cl. B62b *3/04*
U.S. Cl. 280—47.13 **3 Claims**

The invention relates to a skate device for transporting unwieldly, large flat objects with case. The device comprises an elongated base member containing a pair of brackets at each end and a clamping bracket member at its midsection. Rollers are provided on the bottom of the base member and are all in line. The end rollers are mounted slightly above the midsection roller to enable the skate to be tipped backward or forward on the end rollers for maneuverability. The skate is clamped to an edge of the flat object for transporting.

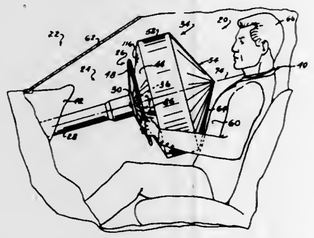
3,580,602
STORAGE RACK
Gerard E. Hebert, Livonia, Mich., assignor to Lockhart Manufacturing Corporation, Farmington, Mich.
Filed Dec. 12, 1968, Ser. No. 783,340
Int. Cl. B62b *5/00*
U.S. Cl. 280—79.3 **11 Claims**



The storage rack disclosed herein comprises a base, sides and a back which can be manufactured and shipped

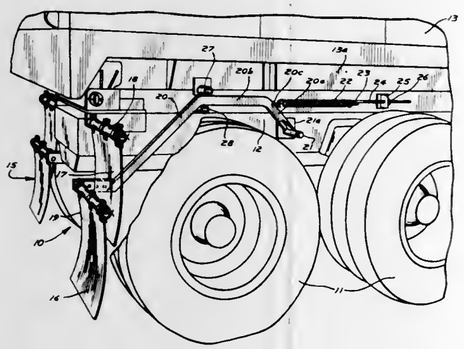
separately to a bakery or other user and can thereafter be readily assembled without welding to form the storage rack. The base, sides and back have interengaging means thereon which are engageable by a sliding movement.

3,580,603
INFLATABLE SAFETY APPARATUS
Richard Chute, Huntington Woods, Mich., and Charles O. Berryman, Madison, Wis., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed July 19, 1968, Ser. No. 746,131
Int. Cl. B60r *21/08*
U.S. Cl. 280—150 **27 Claims**



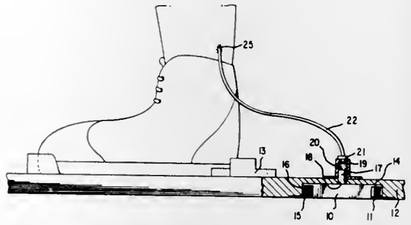
An improved safety apparatus for protecting the driver of a vehicle includes a confinement mounted on the steering wheel and having a circular cone portion which engages the torso of the driver when the confinement is expanded to thereby restrain movement of the driver during a collision. The confinement is inflated from a collapsed condition to an expanded condition in such a manner as to engage the rim of the steering wheel with the confinement before engaging the torso of the driver with the conical portion of the confinement. After forward movement of the torso of the driver has been retarded by engagement with the confinement, the head of the driver engages the conical portion of the confinement.

3,580,604
MUD FLAPS FOR DUMP TRUCKS
Thomas F. Overend, 4379 Dart Ave., Minneapolis, Minn.
Filed Sept. 18, 1969, Ser. No. 859,132
Int. Cl. B62d *25/16*
U.S. Cl. 280—154.5 **8 Claims**



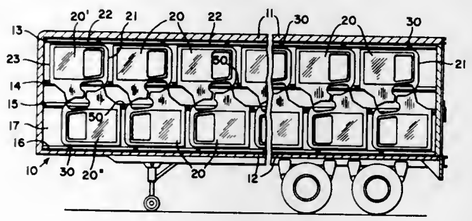
A two-part mud flap assembly for dump trucks, one flap being adjacent the upper portion of the wheel and being stationary with the truck frame; the other lower flap normally lapping the upper flap and slidable into confronting relation with the upper flap. A swingable arm mounting the lower flap normally held down by the dump box; a spring to swing the arm and lower flap upwardly as the dump box is raised.

3,580,605
HYDRAULIC STEERING AND BRAKING SYSTEM FOR SNOW SKIS
Nathan Shreve Spitler, 1802 Briar Ridge Court, McLean, Va.
Filed Oct. 29, 1969, Ser. No. 872,053
Int. Cl. A63c *5/06*
U.S. Cl. 280—11.13H **8 Claims**



A pair of rudder elements are disposed on a ski behind and, respectively to the right and left side of the boot area and are normally maintained in a retracted ineffective position by springs engaged between the rudders and the ski. A pair of elongate hydraulic lines are each connected at one end to one of the rudders and extend under the clothing of the skier whereby a compressible ball at the other end of the lines may be carried on the thumbs of the skier for actuating the rudders selectively with thumb pressure on the balls.

3,580,606
CARGO LOADING AND SUPPORT SYSTEM
Millard C. Wagner, Urbana, Ohio, assignor to Thomas Kappel, Inc., Springfield, Ohio
Filed May 19, 1969, Ser. No. 825,587
Int. Cl. B60p *7/00*
U.S. Cl. 280—179 **9 Claims**

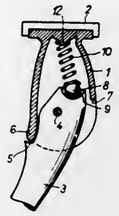


A system for loading and supporting several truck cabs in a van for shipment with the cabs stowed in nested but spaced relationship so that a maximum number of cabs may be shipped without damage to the cabs through contact with each other or the interior of the van. Each cab has a pair of bars having wheels at their outer ends attached to it and extending transversely of the van with the wheels engaging tracks running longitudinally of the van, and stops are associated with the tracks to prevent movement of one of the bars and stabilize the load during shipment.

3,580,607
BICYCLE SUPPORT
Theodor Pletscher, Zurich, Switzerland, assignor to Gebruder Pletscher, Marthalen, Zurich, Switzerland
Filed July 9, 1968, Ser. No. 743,405
Claims priority, application Austria, July 10, 1967, 6437/67
Int. Cl. B62h *1/02*
U.S. Cl. 280—301 **3 Claims**

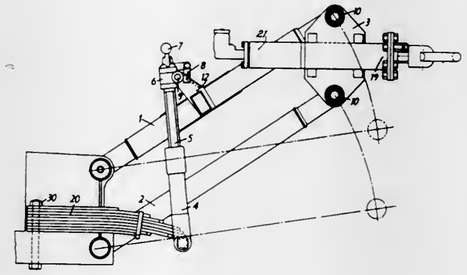
A bicycle support comprises a socket to be secured to the horizontal rear fork members of a bicycle frame, a support arm having one end pivotally connected to said socket for tilting movement of the arm from a position of rest into

operating position and held in one or the other of said positions by a tilting spring acting eccentrically on the arm with respect to its pivoting axis to urge the arm against an abutment on the socket, a spring counterbearing being associated



with said pivotally connected end of the arm. The spring counterbearing is formed by an arched surface, for example by the surface of a ball lodged in a trough formed on the pivotally connected end of the support arm, or by a concave arched surface of the trough itself.

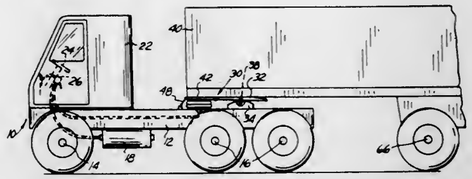
3,580,608
TRAILER TOWING ARRANGEMENT
Charles Clark Simpson Grant, Kempston, Bedford, England, assignor to Ibbett Engineering Company Limited, Bedford, England
Filed Jan. 13, 1969, Ser. No. 790,634
Claims priority, application Great Britain, Jan. 19, 1968, 2,946/68
Int. Cl. B60d *1/16*
U.S. Cl. 280—405 **5 Claims**



The towing arrangement for attachment to a vehicle having two pairs of parallel arms having pivotal mountings at each end for connection at one end to a vehicle and at the other end to a tow body housing thereby forming a wishbone arrangement converged towards the housing. A connector which fits a coupling on another vehicle is attached to the tow body housing. A spring or hydraulic element is provided between the vehicle and the paris of parallel arms to exert an upward force on the latter.

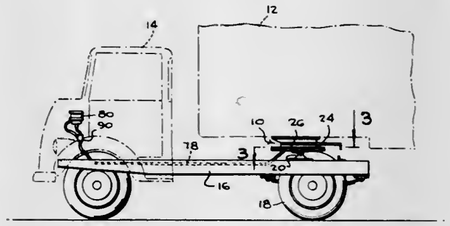
3,580,609
FIFTH WHEEL WITH LOAD-TRANSFERRING DEVICE
Michael F. Paielli, 6841 Harding, Taylor, Mich.
Filed Dec. 8, 1969, Ser. No. 883,072
Int. Cl. B62d *53/00*
U.S. Cl. 280—405 **4 Claims**

A fifth wheel for connecting tractors and trailers consisting of a pivoted coupling member having on the forward end thereof a hinged member supported by a pair of inflatable air bags seated on the tractor frame. The air bags are operatively connected into the compressed air system of the tractor through a control valve which enables the driver to distribute



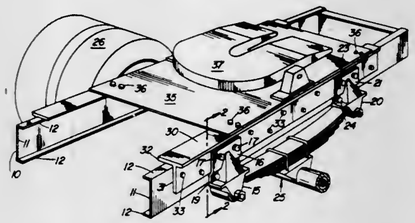
the load in the trailer between the steering, driving and trailer axles by varying the pressure in the inflatable air bags.

3,580,610
AUTOMATIC ANTIJACKKNIFING CONTROL FOR ARTICULATED VEHICLES
Robert C. Warren, 26 Salem Ave., and Robert G. Adams, P.O. Box 508, Carbondale, Pa.
Filed May 6, 1969, Ser. No. 822,201
Int. Cl. B62d *53/10*
U.S. Cl. 280—432 **5 Claims**



A device for preventing the trailer portion of a vehicle from jackknifing by automatically restraining the trailer portion and the tractor portion of the vehicle from moving relative to each other, except during right- or left-hand steering maneuvers.

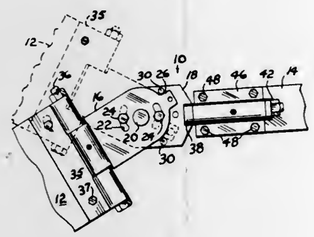
3,580,611
FIFTH WHEEL SUPPORT SYSTEM
Lewis F. McNitt, Bay Village, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed Jan. 27, 1969, Ser. No. 794,126
Int. Cl. B62d *53/08*
U.S. Cl. 280—433 **3 Claims**



A right-angled or T-shaped element is secured to the web of a tractor (tractor-trailer combination) frame over its spring hanger supports. The flat area of the T is spaced from the channel flanges and the depending section may or may not extend into the area of spring hanger supports. If it does the spring hanger supports are initially made with an offset upper section into which the T-section can be inserted. The offset spring hangers can be originally provided with spacer

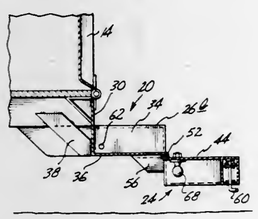
elements which are removed when the dependent section of the T-element is positioned and secured to the frame web sections.

3,580,612
TRAILER HITCH
Arthur W. Pearson, 506 Ramblewood, Edmond, Okla.
Filed Apr. 3, 1969, Ser. No. 813,139
Int. Cl. B60d *1/16*
U.S. Cl. 280—492 **1 Claim**



A pair of pivotally interconnected horizontal plates are pivotally connected, respectively, with a towing vehicle and a towed vehicle for movement about a horizontal axes.

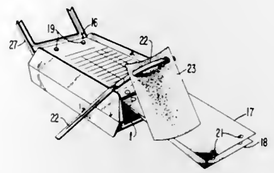
3,580,613
BUMPER COMBINING HITCH AND STEP
Walter A. Northrop, Hayes Route, Box 9-A, Woodland, Wash.
Filed Feb. 27, 1969, Ser. No. 802,882
Int. Cl. B60d *1/06;* **B60r** *3/02, 19/00*
U.S. Cl. 280—500 **4 Claims**



A vehicle bumper having a trailer hitch step construction including an elongated bumper assembly which, in operative position, is mounted at the end of a vehicle and in a position extending transversely of the vehicle. A bumper section hinged to the bumper assembly between its ends is swingable from a raised position rearwardly and downwardly to form a step. The bumper section in its raised position seats within a well defined between end portions of the bumper assembly. The bumper section in its raised position is surfaced with a plate which is substantially flush with plates provided in the end portions of the bumper assembly. A trailer hitch component is mounted within a recess provided adjacent the rear margin of the bumper section.

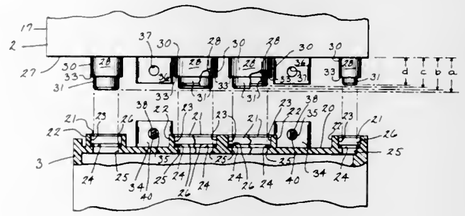
3,580,614
POCKET REGISTER
Rodney W. Winston, North Tonawanda, and Peter M. Witham, Nottingham, N.Y., assignors to Moore Business Forms, Inc., Niagara Falls, N.Y.
Filed Jan. 23, 1969, Ser. No. 793,342
Int. Cl. B41l *5/16*
U.S. Cl. 282—3B **8 Claims**

A pocket register for containing a supply of manifolding material comprising a container for said material, a writing surface mounted within the container over which a strip of the material may be extended after being withdrawn from the interior of the container, means on the writing surface for engaging sheets of transfer material to be interposed between superposed portions of several sheets of manifolding material and adapted to limit extension of the withdrawn sheets, and a



substantially open, easily locked cover means for positioning the strips of withdrawn record material onto the writing surface thereby enabling writing to take place.

3,580,615
SOFTENER CONTROL ASSEMBLY
David G. Prosser, Milwaukee, Wis., assignor to Autotrol Corporation, Milwaukee, Wis.
Filed June 24, 1968, Ser. No. 739,539
Int. Cl. F16l *37/14, 39/00*
U.S. Cl. 285—81 **5 Claims**

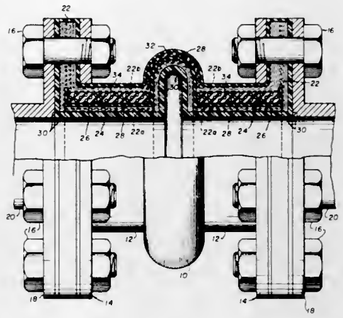


A water-softener control assembly for automatically controlling regeneration and adapted for connection to a water-softening tank. The assembly has a base unit connected to the tank and containing all the external pipe connections, and a separately removable control unit containing substantially all of the working control elements but none of the external pipe connections. The control unit is releasably connected to the base unit by a U-shaped locking member whose projecting arms are received in the aligned apertures of cooperating ribs projecting from adjacent opposed surfaces of the units.

3,580,616
REINFORCED EXPANSION
Joseph Merkwacz, Penfield, N.Y., assignor to Garlock Inc., Palmyra, N.Y.
Continuation-in-part of application Ser. No. 666,870, Sept. 11, 1967, now abandoned. This application Aug. 18, 1969, Ser. No. 850,983
Int. Cl. F16l *27/10, 51/00*
U.S. Cl. 285—229 **6 Claims**

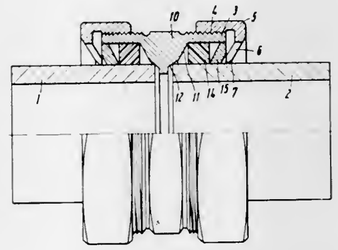
Cylindrical portions of an expansion joint, at opposite sides of an expansible arch of the joint, have reinforcing means integral therewith in the form of a spaced-turn coil of glass-fiber cord embedded within a cylindrical mass of flexible

rubber. The rubber prevents interengagement of the turns of the coil and enables the joint's cylindrical portions to expand



and contract axially. The coiled cord strongly opposes radial expansion of said cylindrical portions from internal pressure.

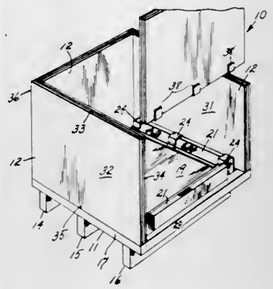
3,580,617
PIPE UNION
Hermann Ehrenberg, Langen-Hessen, Germany, assignor to Fouquet-Werk Frauz & Planck, Rottenburg Neckar, Germany
Filed May 28, 1969, Ser. No. 828,795
Claims priority, application Germany, May 28, 1968, P 17 50 710.7
Int. Cl. F16l *19/08*
U.S. Cl. 285—340 **13 Claims**



Two pipes have axially aligned proximal end portions. A sleeve surrounds the end portions with clearance and has an annular radially inwardly extending projection which forms an inner annular ridge located between the facing axial end-faces of the pipe end portions. At each axial side of the annular projection a scaling ring is received in the clearance, followed by a pressure-transmitting ring. Nuts are screwed exteriorly onto each axial sleeve end, surround the same and the associated pipe end portion, and deforming the sealing rings through the intermediary of the associated pressure-transmitting rings into sealing engagement with the sleeve and the associated pipe end portion.

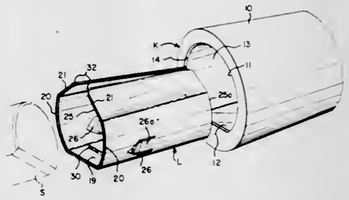
3,580,618
COMBINATION CLEAT AND CLIP MEANS FOR ASSEMBLING COLLAPSIBLE CONTAINERS
Julius B. Kupersmit, 299 W. 12th St., New York, N.Y.
Filed Sept. 15, 1969, Ser. No. 857,838
Int. Cl. F16b *7/00*
U.S. Cl. 287—20.924 **1 Claim**

A combination cleat and clip means for interconnecting the sides of a collapsible container with the bottom or floor thereof, the cleat being secured to said bottom or floor and having a recess, the principal axis of which is parallel to the plane of said bottom or floor; the clip being secured to a surface of a wall, and having resiliently expandable means extending laterally from the plane of said wall and engaging said recess in such manner that said cleat is gripped on opposite sides thereof between said resiliently expandable



means and a surface of said wall, to maintain said wall substantially at a right angle with respect to said bottom or floor. The invention has application to other structures, as for example the assembly of furniture and the like.

3,580,619
SPRING CLIP
Frederick Jean Maltais, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Mar. 6, 1970, Ser. No. 17,095
Int. Cl. F16d *1/06*
U.S. Cl. 287—53 **6 Claims**

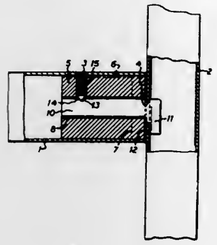


A clip has been provided for securing a knob to a D-shaped shaft, by inserting it in an aperture in the knob. The clip is a longitudinally split spring which seizes in the knob and grasps the shaft by means of springlike longitudinally tapered panels cooperating with centering protrusions in said spring thereby frictionally engaging and centering the shaft in the knob. A plurality of projecting, pointed barbs may be provided to depend from the spring and to engage in a locking or seizing relationship the clip spring into the inner wall of the receiving aperture. The centering protrusions also provide a positive engagement as well as proper centering of the D-shaft in the knob aperture, thereby holding the knob on the D-shaft substantially without wobbling and still allowing the D-shaft to be withdrawn and reinserted numerous times without substantial loss of performance.

3,580,620
FASTENING DEVICES
Adrian Gottfried Offenbroich, 49 Sodra Forstadsgatan 211, Malmo, Sweden
Filed Mar. 10, 1970, Ser. No. 18,063
Claims priority, application Sweden, Mar. 11, 1969, 3,292/69
Int. Cl. F16b *7/00*
U.S. Cl. 287—54 **1 Claim**

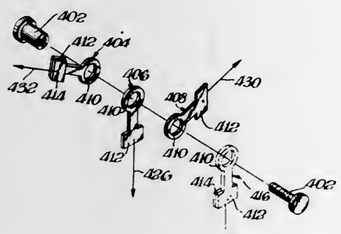
Fastening device for disengageably joining a first and a second preferably tubular structural part, comprising an expander body, being at least partly slotted and nested in the

open end of the first structural part and having a longitudinal chamber for a joining member, which on its end has a hook for engagement behind an edge portion of an opening in the



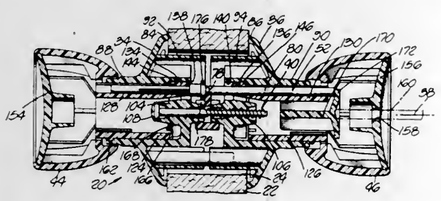
second structural part and has a sloping surface for cooperation with the conical end of a screw, threadedly engaged in the expander body.

3,580,621
EYELET AND LUG ASSEMBLY
Robert F. Chambers, 504 Beverly Road, Newark, Del.
Division of Ser. No. 735,259, June 7, 1968, Pat. No. 3,520,981, July 21, 1970. This application Mar. 23, 1970, Ser. No. 003,619
Int. Cl. F16c *11/00*
U.S. Cl. 287—101 **2 Claims**



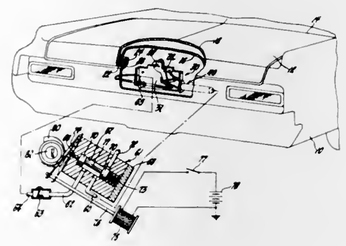
Assembly comprises eyelet in form of shaft with series of lugs mounted on shaft. Each lug includes looped end portion of same thickness that loosely surrounds shaft and coplanar end portion of same thickness as looped portion. Looped portions of lugs contact one another in line on shaft. At least one of end lugs in line includes additional portion connected and equal in thickness to its coplanar end portion with additional portion offset in direction of adjacent lug in line.

3,580,622
DOOR LATCH
Philip R. Morgan, Monrovia, Calif., assignor to Acme Appliance Manufacturing Company, Monrovia, Calif.
Filed May 12, 1969, Ser. No. 823,839
Int. Cl. E05b *3/06, 9/08, 15/16*
U.S. Cl. 292—169 **8 Claims**



A door latch or lock to be mounted on a door having an opening therethrough adjacent one edge and having a hole in such edge into the opening, comprising two escutcheon members respectively insertable into and adapted to overlie the ends of the opening through the door, two knobs respectively mounted on the escutcheon members, a latchbolt housing insertable into the hole in the door edge and containing a latchbolt, and means connected to the knobs for retracting the latchbolt. The latchbolt housing and the escutcheon members interlock, and a single screw coaxial with the knob axis interconnects the escutcheon members to secure the escutcheon members and the latchbolt housing in assembled relation. The knobs are merely snapped into place in rotatably mounting them on the excutcheon members. The device may be used either as a simple door latch capable of being opened by rotating either knob, or it may be used as a door lock which can be locked from one side and which can be unlocked from the other side in an emergency. With two or three exceptions, all of the parts of the device are made of plastic materials, the external surfaces of the exposed parts being suitably finished.

3,580,623
LATCH MECHANISM
Theodore F. Peters, Utica, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed July 31, 1969, Ser. No. 846,538
Int. Cl. E05b *51/00;* **E05c** *3/06*
U.S. Cl. 292—201 **5 Claims**

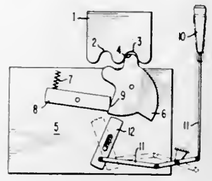


A latch mechanism of the type comprising a latchbolt pivotally mounted on a vehicle body for releasably engaging a striker secured to the vehicle deck lid, the latchbolt being moved from an unlatched position toward a latched position upon engagement with the striker. Continued movement of the latchbolt to the latched position is power assisted by a differential-fluid-pressure-operated motor connected to the latchbolt. The operation of the differential-fluid-pressure-operated motor is controlled by fluid valves, one of which is actuated upon initial movement of the latchbolt toward the latched position to operate the motor for effecting continued movement of the latchbolt to the latched position at which position it is releasably engaged by a latch hook.

3,580,624
INSTALLATION FOR CONTROLLING THE CLOSING CONDITION OF PARTS ADAPTED TO BE MUTUALLY LOCKED, ESPECIALLY IN MOTOR VEHICLES
Gunter Gmeiner, and Christian Grabner, Sindelfingen, Germany, assignors to Daimber-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany
Filed Aug. 23, 1968, Ser. No. 754,914
Claims priority, application Germany, Aug. 26, 1967, P 16 53 957.4
Int. Cl. E05c *3/26*
U.S. Cl. 292—216 **16 Claims**

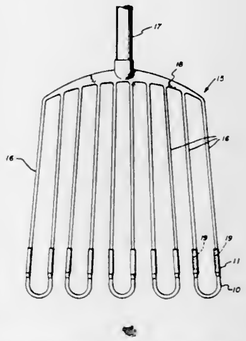
An installation for controlling the closing condition of parts adapted to be mutually locked or closed, especially in motor vehicles in which the engaging condition of a closure

device is sensed by appropriate means and a feedback signal, which may be either mechanical, optical or acoustic in na-



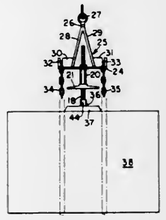
ture, indicates when the parts are completely closed or locked.

3,580,625
ATTACHMENT FOR A TINED FORK
Edwin F. Booth, Rte. 1, Alamosa, Colo.
Filed July 22, 1969, Ser. No. 843,410
Int. Cl. A01d *9/00*
U.S. Cl. 294—59 **5 Claims**



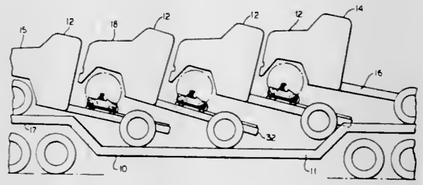
An attachment for a tined fork comprising a generally U-shaped body having substantially parallel hollow side members connected to a curved body portion, the side members being dimensioned to fit frictionally on the ends of a pair of adjacent tines of a fork, and to be firmly retained thereon without fastening means but removable for replacement. The attachment prevents injury to potatoes and other produce being handled by the fork.

3,580,626
CLAMPING FIXTURE FOR USE IN A HOISTING AND LIFTING DEVICE
Luell Hilburn, 7240 Manila Ave., El Cerrito, Calif.
Filed Feb. 14, 1969, Ser. No. 799,173
Int. Cl. B66c *1/12*
U.S. Cl. 294—67 **9 Claims**



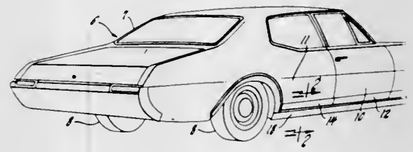
A hoisting device. A rigid base and a rigid symmetrical frame are joined by jack means comprising two members joined together for motion toward and away from each other, one member being secured to the base and one to the frame, for moving the frame and base relatively to each other. The frame has at its upper end, a ring for engagement by a pickup device, and it has a pair of diagonal braces extending from the ring, and a transverse portion lying perpendicular to the angle bisecting the angle formed by the braces and joining the braces and extending beyond them, and a pair of vertical anchor slots, one adjacent each end of the transverse portion beyond the braces. Linear flexible retention means, such as a chain or cable, secured in the slots are passed around an object to be hoisted, the jack means being used to tighten the base against the object to be hoisted and causing it to bear against it and force the object tightly against the linear flexible retention means, so that the assembly can then be lifted by lifting the ring.

3,580,627
MOTOR VEHICLE LOADING AND TRANSPORTING DEVICE
Ray L. Underwood, 65 Spokane, Pontiac, Mich., and Thomas A. Campbell, 4885 Clarkston Road, Clarkston, Mich.
Filed Sept. 20, 1968, Ser. No. 761,052
Int. Cl. B60p *3/06*
U.S. Cl. 296—1 **2 Claims**



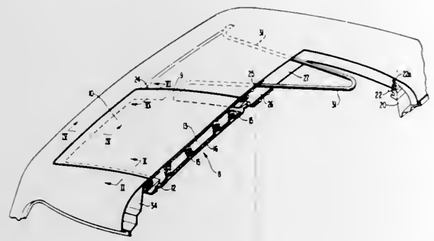
This invention provides a method or means for telescopically loading motor vehicles for transporting them including a longitudinal track detachably mounted on the chassis box frame of a supporting vehicle and a rollable carriage having rollers on its lower portion riding on said track, the upper portion of the carriage adapted to be engaged by the front axle of a second vehicle which is driven over the rear end of the supporting vehicle, the front end of the second vehicle being carried rollably forward solely by the carriage as the second vehicle is driven forwardly partly on its rear wheels and partly on the chassis of the supporting vehicle.

3,580,628
ROCKER-MOLDING INSTALLATION
Charles W. Rantala, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed July 16, 1969, Ser. No. 842,129
Int. Cl. B62d *23/22*
U.S. Cl. 296—1 **4 Claims**



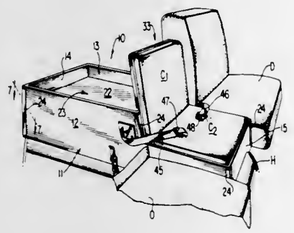
An arrangement for securing a rocker molding to an automobile rocker panel notwithstanding the presence of a body panel lower molding immediately above the rocker panel. The rocker molding hooks over clips which may move vertically on the rocker panel and the ultimate location vertically of the rocker panel is fixed by screws entering the bottom of the rocker panel through a flange on the molding.

3,580,629
INSTALLATION FOR CLOSING OR OPENING APERTURES IN VEHICLES
Gerhard Heim, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany
Filed Dec. 5, 1968, Ser. No. 781,502
Int. Cl. B60j *7/04*
U.S. Cl. 296—137 **35 Claims**



An installation for the selective closing and opening of openings in vehicles by means of a closure part which is guided in appropriate guide means and which is actuated by an actuating mechanism; the closure part includes a chamber with variable volume while the forces acting in either the expansion or contraction direction of the chamber engage at the closure part and at a fixed place in the vehicle.

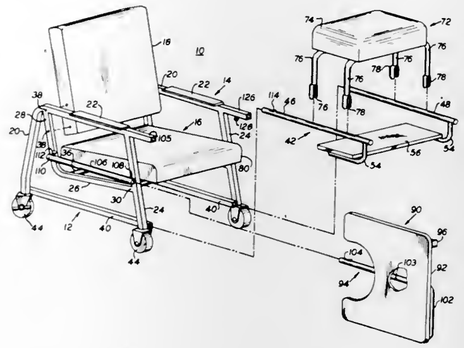
3,580,630
UTILITY HUMP SEAT AND DOUBLE TRAY
Paul E. Fetter, R.D. #1, Selinsgrove, Pa.
Filed Nov. 6, 1969, Ser. No. 874,461
Int. Cl. A47b *85/04*
U.S. Cl. 297—125 **10 Claims**



This disclosure relates to a convertible seat tray constructed to overlie conventional humped engine housings of utility-type trucks, the seat tray including a back tray which is at all times accessible and a front tray which is accessible when a backrest is in its collapsed position. The front tray is formed by a ledge secured to the back side of the backrest and thus does not interfere with an occupant when the backrest is in its upright position.

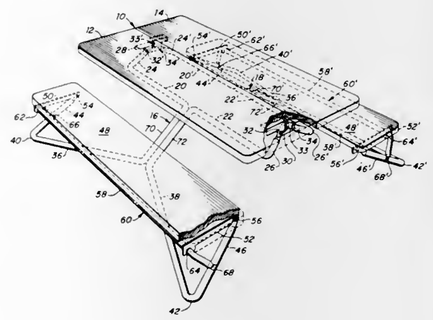
3,580,631
INVALID CHAIR
Charles E. Murcott, Huntington, N.Y., assignor to Lumex Inc., Bay Shore, N.Y.
Filed Feb. 10, 1969, Ser. No. 797,753
Int. Cl. A47c *39/00*
U.S. Cl. 297—155 **16 Claims**

An invalid chair is disclosed which includes first and second frames between which is removably supported a seat assembly which is longitudinally slidable with respect to the side frames. The chair further includes a table tray which can be moved between a noninterfering or storage position with respect to bodily access to the seat, and a tablelike position by merely aligning a single arm fixed to the table with a a passageway within one of the chair arm rests. Additionally, a foot rest is slidably disposed beneath the seat assembly and



movable between a storage position and a forward foot rest, where it is adapted to support an ottoman having bifurcated legs.

3,580,632
FOLDING TABLE AND SEAT SUPPORT STRUCTURE
Paul Maurice Seymour, 14 Fremont St., Marlboro, Mass.
Filed May 21, 1969, Ser. No. 826,594
Int. Cl. A47c *39/00*
U.S. Cl. 297—157 **8 Claims**

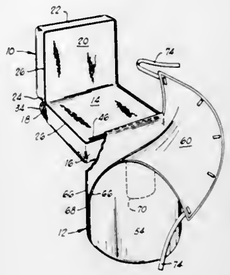


A folding combination table and seat including a support structure therefor, including upper support means having two connector portions, spaced from each other in a first direction, for connection with the table, lower support means having two bearing means, spaced from each other in a second direction, for contacting a supporting surface, two seat support means, spaced from each other in a third direction, and intermediate support means interconnecting the upper support means with the lower support means.

3,580,633
STADIUM FOOT BAG AND SEAT
Florence Du Priest, 519 No. 13th St., Waco, Tex.
Filed May 9, 1969, Ser. No. 823,315
Int. Cl. A47c *7/10*
U.S. Cl. 297—184 **5 Claims**

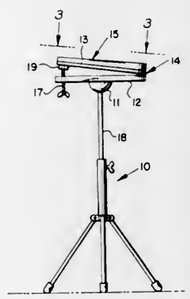
A foot bag for stadium use which completely encloses the feet and lower legs of the user and extends up over the upper legs and lap of the user when the user is seated, with a belt being attached to the upper end of the foot bag for attachment around the waist of the user. The foot bag is used

in conjunction with a stadium seat having a seat bottom and a seat back hinged together with bracing to limit the rear-



ward movement of the seat back and form a handle for the seat. Dual seats and foot bags are also disclosed.

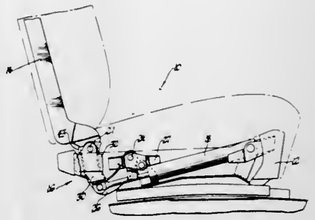
3,580,634
TILTABLE DRUMMER'S SEAT
John T. Bock, 9 Hillview Place, Elmsford, N.Y.
Filed Jan. 28, 1969, Ser. No. 794,498
Int. Cl. A47c *9/12*
U.S. Cl. 297—313 **6 Claims**



A stool having a horizontal plate constrained to a horizontal position and a similarly shaped seat plate hinged to the horizontal plate at its forward edge, and a cushion mounted on the seat plate, with adjusting screwbolts extending threadably through the rear portion of the horizontal plate to engage and tilt the seat plate to any desired angle within the range provided.

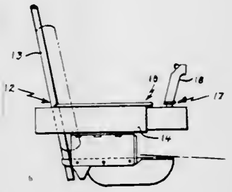
3,580,635
RECLINING FORWARD FOLDING SEAT
Raymond C. Posh, Livonia, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Aug. 14, 1968, Ser. No. 752,529
Int. Cl. A47c *1/032*
U.S. Cl. 297—355 **36 Claims**

A seat assembly including a cushion frame and a back frame with control means operatively interconnecting the frames for allowing the back frame to recline from an upright seat-forming position while preventing forward folding movement and for allowing forward folding movement of the back frame from the upright seat-forming position while preventing reclining movement. Two embodiments are disclosed and in each embodiment the control means includes a C-shaped link pivotally connected to the cushion frame on the folding axis and pivotally connected to the back frame at a point on the reclining axis when in the upright seat-forming position. A second link is pivotally connected to the cushion frame on the reclining axis and depends therefrom and has various flanges to coact with a dependent arcuate section of the back frame and the C-shaped link for allowing folding movement while preventing reclining movement and vice versa. A positioning mechanism interconnects the cushion frame and the lower end of the second link for controlling the reclining



position of the back frame. In one embodiment the reclining and folding axes intersect and in another embodiment the axes are parallel.

3,580,636
DUAL SIDE ARM CONTROLLER
Joseph B. Setto, Los Angeles, Calif., assignor to the United States of America as represented by the Secretary of the Air Force
Filed Jan. 14, 1970, Ser. No. 2,708
Int. Cl. A47c *7/54;* **B64c** *13/04*
U.S. Cl. 297—417 **9 Claims**

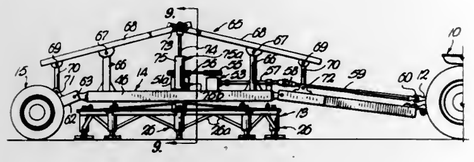


A dual side arm controller for use within the armrests of a seat. The seat is made up of a back portion and a pair of retractable armrests. The side arm controller is made up of a handgrip, cables and torque tube. The relationship between these elements allow for the retractable movement of either of the armrests without substantially affecting the operation of the side arm controllers.

3,580,637
METHOD OF DESTROYING FERROCONCRETE, ROCK OR THE LIKE
Yoshishige Itoh; Masatada Kawamura, both of Tokyo, and Yoshio Kasai, Funabashi, all of Japan, assignors to Fuji Motors Corporation, Higashiyamato, Tokyo, Japan
Filed Oct. 9, 1968, Ser. No. 766,262
Claims priority, application Japan, Oct. 21, 1967, 42-67503
Int. Cl. H05b *1/00;* **E21c** *37/18*
U.S. Cl. 299—14 **5 Claims**

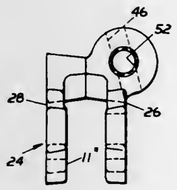
The method of destroying a ferroconcrete body formed of a concrete mass having metal reinforcement bars embedded therein, said method uses the reinforcement bars as electrical conductors and heats them by the application of electric current thereto to cause sufficient thermal expansion of the reinforcement bars to cause cracking of the concrete and to simultaneously lower the adhesion between the reinforcement bars and the concrete.

3,580,638
PACKED SNOW AND ICE REMOVER FOR HIGHWAYS AND THE LIKE
Robert K. Pullen, Fullerton, Nebr.
Filed June 13, 1969, Ser. No. 832,961
Int. Cl. E01h *5/12*
U.S. Cl. 299—25 **4 Claims**



A powered rotor carrying a plurality of cutting blades is supported from a mobile frame. The cutting blades have cutting or milling edges for engaging and advancing laterally into a bed of ice or packed snow. The support connection between the rotor and frame is such as to provide control over the spacing and pressure of the blades with respect to the covered surface and the blades are resiliently floatable to accommodate uneveness in the surface.

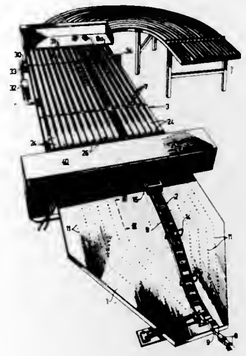
3,580,639
CUTTER CHAIN
Ralph W. Mitchell, 1421 Liberty St., Franklin, Pa.
Filed Apr. 18, 1969, Ser. No. 817,346
Int. Cl. E21c *25/34*
U.S. Cl. 299—84 **10 Claims**



An endless flexible cutter chain and more particularly a chain consisting of a plurality of rigid links with all of the rigid links consisting of two body portions and through the use of only two basic body portions, a chain is constructed which comprises single-bit cutter links, double-bit cutter links and/or cutter links having no means for receiving cutter bits therein.

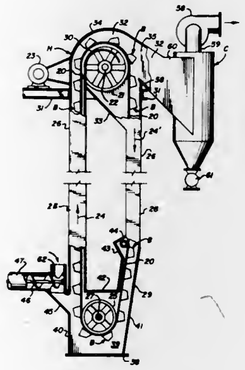
3,580,640
SYSTEM FOR DISTRIBUTING AND ADVANCING OBJECTS
Birger Sture Erik Eriksson, Tranghalla, Sweden, assignor to Aktiebolaget Jonkoping, Vulcan, Jonkoping, Sweden
Filed Mar. 18, 1969, Ser. No. 808,179
Claims priority, application Sweden, Mar. 22, 1968, 3829/68
Int. Cl. B65g *47/26, 51/02*
U.S. Cl. 302—2R **9 Claims**

A system for distributing and advancing objects comprises a continuously pendulating, flexible distributing arm or chute with an inlet end into which said objects are fed sequentially at high velocity, and an outlet end which reciprocates transverse to a plurality of individual tracks which are separated from each other by separating means. The outlet end of the distributing arm is located on a higher level than that end of the separating means which is located nearest to the arm. The system further comprises means for compulsory advancing said objects along said arm and said tracks so that the ob-



jects passing the arm in a single row become uniformly distributed amongst said tracks.

3,580,641
METHOD OF AND APPARATUS FOR INCREASING THE CAPACITY OF BUCKET ELEVATORS
Charles M. Schloss, Jr., 1626 Wazee St., Cherry Hills Village, Colo.
Filed Apr. 28, 1969, Ser. No. 827,458
Int. Cl. B65g *53/04*
U.S. Cl. 302—12 **24 Claims**



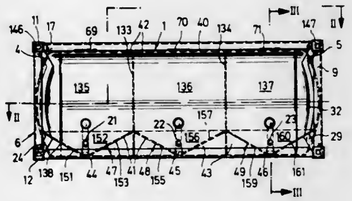
The method comprises producing a flow of air at and adjacent and in the same direction of movement of an arcuate path of the buckets toward an outlet, by means of which airflow the divided material carried by the buckets is assisted in the proper path out of the casing. Particles are separated from the air, after passage through the outlet, and this air may be circulated to an upper housing adjacent the arcuate path; or to a lower housing in which the buckets are loaded. The apparatus for carrying out the above method may include a cyclone separator or the like, a blower connected thereto or connected to the lower housing, or connected for discharge of air into the upper housing, such as tangentially to a concave top thereof. The apparatus may also include a discharge chamber having two outlets, one leading to the separator and the other to a discharge conveyor or the like. The blower may also be driven by the shaft of an upper pulley or incorporated in the upper pulley.

The method also includes producing a flow of air at and adjacent and in the same direction of movement of material entering a bucket elevator casing inlet, to enhance the transport of sluggishly flowing materials into said casing.

3,580,642
COMBINATION GRAVITY AND PNEUMATIC GATE ARRANGEMENT FOR HOPPERS
Ernest J. Nagy, Munster, Ind., assignor to Pullman Incorporated, Chicago, Ill.
Filed Mar. 10, 1969, Ser. No. 805,500
Int. Cl. B65g *53/40*
U.S. Cl. 302—52 **3 Claims**

A hopper discharge arrangement includes a combination of a gravity gate and a pneumatic gate which may be positioned in closed relation underneath the discharge end of a hopper and which may be moved to one side of the discharge end for effecting gravity discharge of materials contained within the hopper. A manually operated rack and pinion arrangement is provided on the gravity gate which cooperates to effect sliding movement thereof. The pneumatic gate includes a dish-shaped pan having a pneumatic outlet connected thereto and the said gravity gate and pneumatic gate may be interconnected by means of an interlocking device to provide for conjoint movement. The interlock device is effective to lock the gravity and pneumatic gates in a closed position or together for simultaneous movement. The interlock device also may be readily disengaged to permit sole movement of the gravity gate to an open position whereby the pneumatic gate remains in a pneumatic discharge position underneath the discharge end of the hopper.

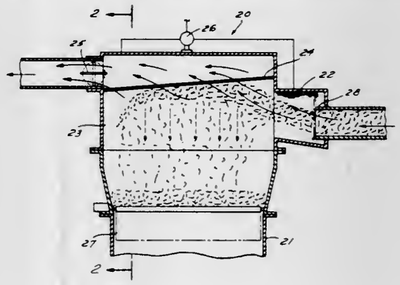
3,580,643
TRANSPORT CONTAINER FOR FLOWABLE MATERIAL
Artur Spitzer, Mosbach Baden, Germany, assignor to Ludwig Spitzer Sen. KG (Kommanditgesellschaft), Mosbach/Baden, Germany
Filed Aug. 8, 1968, Ser. No. 751,200
Claims priority, application Germany, Aug. 12, 1967, P 15 86 914.4
Int. Cl. B65g *53/40*
U.S. Cl. 302—53 **9 Claims**



A pressurized shipping container including a cylindrical tank surrounded by a rectangular frame. The tank is provided with a plurality of internal, inverted pyramid or funnel shaped, false bottoms for emptying the flowable contents of the container. The plurality of such inclined false bottoms greatly reduces the dead space in the tank. Discharge flow may be assisted by making the false bottoms of porous material and forcing air up through them to provide an air cushion on their inner surfaces.

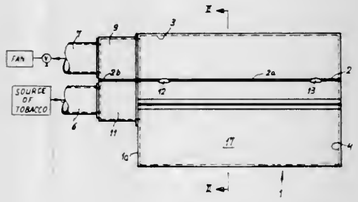
3,580,644
PNEUMATIC FEED SYSTEM FOR UNIFORM SUPPLY OF TOBACCO TO CIGARETTE MAKING MACHINES
Francis J. Jr. Ballard, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.
Filed Mar. 4, 1969, Ser. No. 804,071
Int. Cl. B65g *53/40*
U.S. Cl. 302—59 **2 Claims**

A tobacco discharger associated with a cigarette making machine and an automatic tobacco conveying system for pneumatically conveying tobacco from a storage area to the cigarette machine wherein the conveying system includes a main feed pipe coupled with the source of the stored tobacco and the discharger, air differential pressure means for forcing air through the pipe at a predetermined conveying velocity, a tobacco feeder at the source of stored tobacco for feeding the tobacco into the main feed pipe, and air pressure sensitive means for sensing the air pressure in the main pipe and actuating the operation of the feeder upon attainment of the



predetermined conveying velocity of the air to the discharger. The discharger includes a housing having an air inlet end coupled with the main feed pipe and an air discharge end. It also contains tobacco separating means within the housing for separating tobacco carried by air entering the inlet end so that the separated tobacco is uniformly distributed within the housing. Means are also included for causing the uniformly separated tobacco to be discharged into the cigarette making machine in a constantly uniform manner due to the uniform positioning of the separated tobacco within the housing.

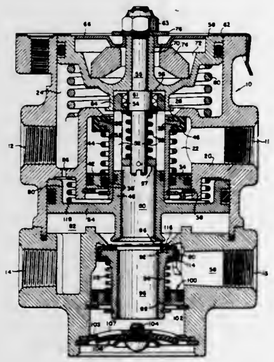
3,580,645
APPARATUS FOR TRANSPORTING AND COLLECTING SHREDDED TOBACCO OR THE LIKE
Klaus Hagenah, Hamburg, Germany, assignor to Hauni-Werke Korber & Co. K.G., Hamburg, Germany
Filed Mar. 7, 1969, Ser. No. 805,225
Claims priority, application Germany, Mar. 15, 1968, P 16 57 255.7
Int. Cl. B65g *53/40*
U.S. Cl. 302—59 **10 Claims**



Apparatus for supplying shredded tobacco to the distributor of a rod cigarette machine comprises a magazine having a front wall connected with the discharge end of a tobacco-admitting first pneumatic conduit and with the intake end of an air-evacuating second pneumatic conduit. A sieve divides the interior of the magazine into an upper compartment which communicates with the intake end of the second conduit and a lower compartment which communicates with the discharge end of the first conduit. The sieve has a first section which offers a relatively low resistance to the passage of air from the lower compartment into the upper compartment when the second conduit evacuates air from the magazine while the first conduit admits tobacco-laden air, and a second section which offers greater resistance to the passage of air and is bypassed by tobacco shreds which leave the discharge

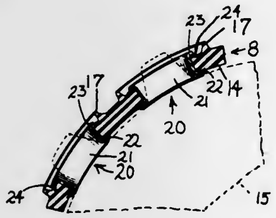
end of the first conduit. The second section of the sieve permits flow of air into the second conduit on partial or complete clogging of the first section.

3,580,646
DUAL CIRCUIT BRAKE VALVE
George E. Ternent, Elyria, Ohio, assignor to Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio
Filed Sept. 17, 1969, Ser. No. 858,702
Int. Cl. B60t *15/02*
U.S. Cl. 303—52 **7 Claims**



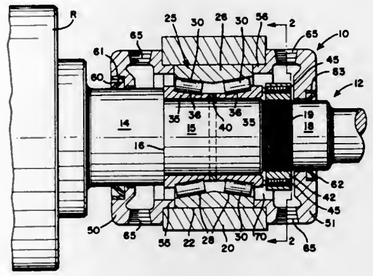
A dual circuit brake valve including first and second self-lapping valve elements for respectively controlling primary and secondary fluid pressure braking circuits, the first valve element being manually controlled and the second valve element being controlled by a relay piston subject to the pressure in the primary circuit wherein the relay piston is subjected to the action of a pair of springs acting in opposite directions so that during operation of the first valve element the crack pressure required to open the second valve element is reduced to a minimum and the application of fluid pressure to the primary and secondary circuits is substantially simultaneous.

3,580,647
SNOWMOBILE TRACK
William R. Richards, Roseau, Minn., assignor to Textron Inc., Providence, R.I.
Filed Oct. 15, 1968, Ser. No. 767,641
Int. Cl. B62d *55/24*
U.S. Cl. 305—35 **9 Claims**



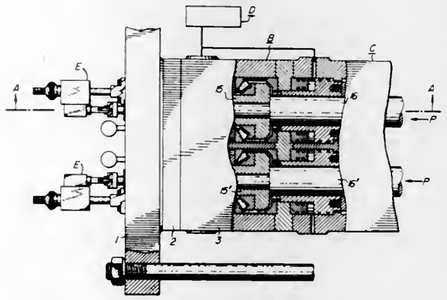
An endless flexible drive belt having longitudinally spaced openings for meshing engagement with the teeth of a drive sprocket wheel, and belt reinforcing and wear elements mounted in the openings. The wear elements have portions that are curved in a direction longitudinally of the belt, the curved portions being formed to closely follow the curvature of the sprocket wheel.

3,580,648
ROLL AND ANTIFRICTION BEARING ASSEMBLY
Stanley C. Zink, Northport, and Joseph J. Slane, Fulton, both of, N.Y., assignors to The Black Clawson Company, Hamilton, Ohio
Filed Apr. 7, 1969, Ser. No. 814,114
Int. Cl. F16c *35/06*
U.S. Cl. 308—207 **5 Claims**



Each journal of a roll is supported by an antifriction roller bearing including an outer race and two inner races spaced axially by a ring of predetermined thickness. The inner races and the spacer ring are pressed axially against a shoulder on the journal by a plurality of jackscrews extending axially through a locknut for minimizing radial runout of the roll.

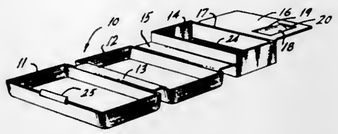
3,580,649
HIGH THRUST BEARING APPARATUS
Shigeru Araki, Hirakata-Shi; Shozo Takahashi, and Ichiro Muto, Osaka, Japan, assignors to Matsushito Electric Industrial Co. Ltd., Osaka, Japan
Filed Aug. 12, 1969, Ser. No. 849,449
Claims priority, application Japan, Aug. 15, 1968, Dec. 7, 1968, 43/58793; 43/89800; 43/89801
Int. Cl. F16c *19/10*
U.S. Cl. 308—233 **5 Claims**



A plurality of thrust bearings to be subjected to a thrust load are arranged coaxially around a thrust shaft. A volumetrically variable air space is formed on one side of each thrust bearing opposite to the load, by means of rigid parts, without using an elastic element such as a bellows, and fluid pressure is supplied to the respective air spaces from a common fluid pressure source so as to create an equal cushioning effect in the respective thrust bearings, whereby the thrust load is taken equally by the respective thrust bearings.

3,580,650
CABINET STRUCTURE
William J. Morris, Woodbury, N.J., assignor to Philco-Ford Corporation, Philadelphia, Pa.
Filed Dec. 23, 1968, Ser. No. 786,199
Int. Cl. A47b *81/06*
U.S. Cl. 312—7 **8 Claims**

A molded, unitary, multisection plastic cabinet structure for a small portable device such as a radio receiver. The sections are joined by integral hinges comprising reduced cross-sectional areas of the plastic material from which the cabinet structure is molded. The sections are so foldable about their

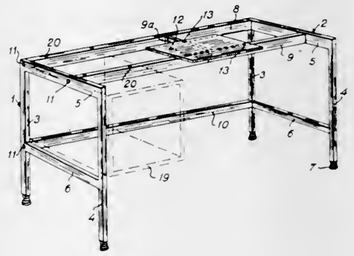


respective hinges as to provide a case for the device, selectively foldable to a stored position within an outer case, and movable to a propped up position for use of the device, or to an extended position for servicing.

3,580,651
TOILET TISSUE HOLDING AND DISPENSING APPARATUS
Morris S. Gauper, 109 Lakeview Blvd., Coleraine, Minn.
Filed May 21, 1969, Ser. No. 826,517
Int. Cl. B65h *19/00*
U.S. Cl. 312—39 **2 Claims**

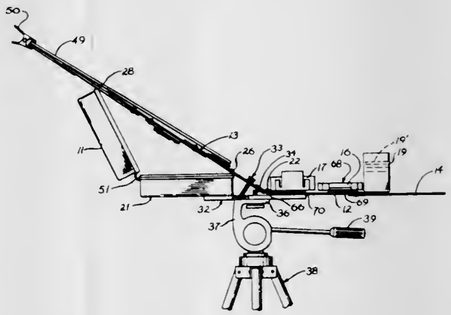
A housing constructed to receive a plurality of rolls of toilet tissue in generally overlying relationship with cradle means for receiving a roll and maintaining it in a dispensing position, a portion thereof operable to reject the empty roll, and stop means operable to allow one roll at a time to be positioned in the cradle means, said cradle means and stop means operating simultaneously to renew the roll in the dispensing position.

3,580,652
TYPEWRITER TABLE
Erik Christian Valeur Nielsen, Birkerod, Denmark, assignor to Max Bodenhoff A/S, Copenhagen, Denmark
Filed Dec. 19, 1968, Ser. No. 785,076
Int. Cl. A47b *21/00*
U.S. Cl. 312—208 **7 Claims**



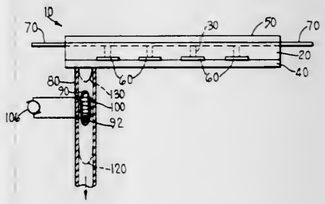
A typewriter table has a steel tube frame which, in order to provide rigidity and to permit ready dismantling, consists of two gable sections and three longitudinal girders rigidly connecting same, two of the girders being upper girders supporting the table top, whereas the third one connects the rear legs at a lower level.

3,580,653
ARTIST'S PAINTING KIT AND TRIPOD ADAPTER THEREFOR
Carroll E. Thomas, San Francisco, Calif.
Filed Nov. 18, 1968, Ser. No. 776,726
Int. Cl. A47b *97/04, 27/00*
U.S. Cl. 312—231 **8 Claims**



The invention comprises, in combination with a camera tripod and a portable kit as described and claimed in my copending application, U.S. Ser. No. 609,536, filed Jan. 16, 1967, and entitled ARTIST'S PAINTING KIT now Pat. No. 3,414,343, for removably carrying artist's equipment and provided with a hinged lid for supporting an easel in predetermined inclined position with respect to a base plate, an adapter disposed in underlying relation to the bottom of said kit and bottom of said baseplate for removably mounting said kit and said artist's equipment upon the top plate of said camera tripod, and means extending through said easel and bearing upon said adapter for removably holding said kit and said artist's equipment including said easel against displacement.

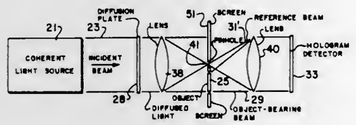
3,580,654
METHOD OF MAKING DISPLAY DEVICES
George A. Kupsky, Milford, N.J., assignor to Burroughs Corporation, Detroit, Mich.
Filed Oct. 2, 1968, Ser. No. 764,983
Int. Cl. H01j *9/38*
U.S. Cl. 316—20 **6 Claims**



A method of making a gas discharge display device comprising assembling the component parts of the device and providing a tabulation through which the device can be filled with the desired gas. A capsule containing an antisputtering agent such as mercury is mounted within the tabulation, along with suitable means by which it may be heated. The device is suitably baked out and otherwise preliminarily processed; the desired gas is introduced; and the tubulation is sealed off with the capsule remaining therein. After any other

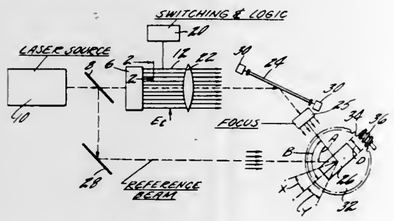
processing steps are carried out as required, the material is freed from the capsule, and, with the entire assembly heated to a suitable temperature to cause the anitsputtering agent to enter the working area of the device, the tubulation is sealed off at an area close to the device itself and with the capsule within the portion of the tubulation which is removed.

3,580,655
WAVEFRONT RECONSTRUCTION
Emmett N. Leith, Plymouth, and Juris Upatnieks, Ann Arbor, both of, Mich., assignors to The Battelle Development Corporation, Columbus, Ohio
Continuation-in-part of application Ser. No. 361,977, Apr. 23, 1964. This application Oct. 23, 1965, Ser. No. 503,993
Int. Cl. G02b *27/00*
U.S. Cl. 350—3.5 **7 Claims**



This invention is directed to methods and apparatus for capturing various patterns of electromagnetic energy emanating from or as they are transformed after passing through an object and reproducing or reconstructing those patterns in their original configuration to produce images identical in appearance to the object itself.

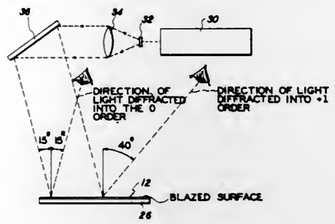
3,580,656
HOLOGRAM APPARATUS AND METHOD
Arthur N. Carson, Bristol, Conn., assignor to Carson Laboratories Inc., Bristol, Conn.
Filed Feb. 1, 1966, Ser. No. 523,995
Int. Cl. G02b *27/22*
U.S. Cl. 350—3.5 **15 Claims**



An information processing system is presented for information storage and retrieval with a color center crystal wherein the information to be stored is generated by electrically modulating a light beam, and the information is then stored by forming a hologram of the desired information in the absence of exposure of the crystal to light from the subject.

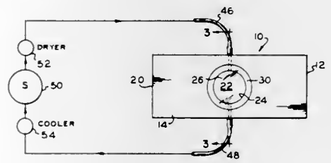
3,580,657
BLAZED SURFACE HOLOGRAM
Nicholas K. Sheridon, Fairport, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed May 14, 1968, Ser. No. 728,986
Int. Cl. G02b *27/22, 5/18*
U.S. Cl. 350—3.5 **27 Claims**

A blazed hologram is produced by exposing a photohardenable material to a stationary standing wave pattern preferably followed by preferential dissolution of the relatively exposed (or relatively unexposed depending on the type of photohardenable material) portions of the exposed photohardenable material in a developer liquid to create, in a preferred embodiment, a blazed, step or sawtoothlike surface profile relief pattern produced by preferential etching, the extent of the etching following sections of the intensity surfaces because the areas of lower exposure are eroded where they come to the surface of the photoresist material and hence are subject to the developer liquid. The optical information presented in exposure is carried in the form of a sur-



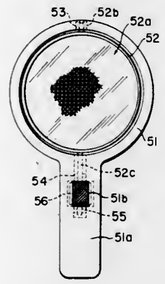
face relief on the developed photohardenable member. This surface relief may be used to reconstruct the optical image and may be used in other advantageous ways as described herein.

3,580,658
GAS COOLED MICROSCOPE SLIDE
Percy L. Swanson, 2244 N.W. Overton, Portland, Oreg.
Filed June 24, 1968, Ser. No. 739,415
Int. Cl. G02b *21/34*
U.S. Cl. 350—93 **8 Claims**



A gas cooled microscope slide having a built-in cooling chamber formed by a through opening in the slide body which is closed top and bottom by spaced laminated glass windows upon which a specimen is placed for observation. Internal passages in the slide body direct a gas coolant to and from the chamber and lead to edge openings in the slide body which are connected by flexible tubing to a coolant source and to cooling and drying elements.

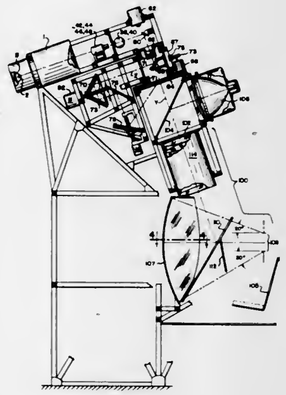
3,580,659
PORTABLE TRAFFIC SIGN
Yoshio Fukushima, Tokyo, Japan, assignor to Kabushiki-Kaisha Ricoh, Tokyo, Japan
Filed July 7, 1969, Ser. No. 839,560
Claims priority, application Japan, July 8, 1968, 43/58015
Int. Cl. G02b *5/12*
U.S. Cl. 350—98 **3 Claims**



A portable traffic sign comprising a frame having a handle and a reflex reflecting plate which may be fixedly or more

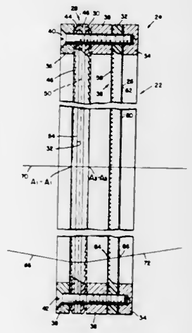
advantageously rotatably secured to the frame. For example, the portable traffic sign carried by a pedestrian crossing a street at night can give a positive warning to a driver.

3,580,660
IMAGE-FORMING APPARATUS
Joseph La Russa, Crestwood, N.Y., assignor to Farrand Optical Co., Inc., New York, N.Y.
Filed Apr. 25, 1966, Ser. No. 544,866
Int. Cl. G03b *21/08*
U.S. Cl. 353—122 **7 Claims**



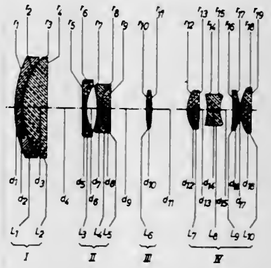
An object plane, the plane passing through the optical center of a lens and perpendicular to its axis, and the plane of an image-receiving means intersect in a common line to produce in the image plane a distorted image of an object in the object plane. A relay lens translates the image in the image plane to the focal plane of an infinity sight to present at infinity an image of the object in the object plane. A varifocal lens produces at the object plane as an object an image at variable magnification of an initial object such as a slide or film strip.

3,580,661
REAR PROJECTION VIEWING SCREEN FOR CLOSE VIEWING
Dexter P. Cooper, Jr., Pasadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.
Filed Apr. 10, 1969, Ser. No. 815,092
Int. Cl. G03b *21/60*
U.S. Cl. 350—128 **18 Claims**



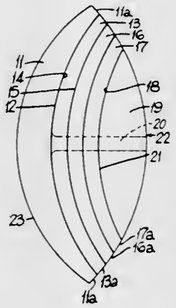
A nonreflective, directional diffusing, rear projection plastic viewing screen for close audience viewing. The screen comprises a composite Fresnel lens structure which includes suitably crossed convex cylindrical Fresnel lens patterns, and a superposed lenticular sheet structure for focusing incremental images—from horizontally overconverged light—at acentrically positioned light-transmitting areas on an opaque, plane viewing surface.

3,580,662
VARIABLE FOCAL LENGTH OBJECTIVE HAVING FOUR LENS GROUPS
Norbert Scholz, Deisenhofenerstr. 70, 8 Munich 90, Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Mar. 10, 1969, Ser. No. 805,762
Claims priority, application Germany, Mar. 8, 1968, P 12 78 132.7-51
Int. Cl. G02b *15/14*
U.S. Cl. 350—184 **1 Claim**



A variable focal length objective of high power has four groups of lenses, and altogether 10 lenses. The variation of the focal length is effected by displacement of the second group of lenses, and the picture is maintained in a constant position by a displacement of the first group of lenses. The aperture ratio is greater than 1 : 2, the quotient of the greatest and smallest focal length is substantially 2.5, and the maximum angle of field is at least ±20°.

3,580,663
COMPOSITE LENSES
Harris Vernon Hicks, Lichfield, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Sept. 10, 1968, Ser. No. 758,855
Claims priority, application Great Britain, Sept. 11, 1967, 41,302/67
Int. Cl. G02b *3/04, 3/08, 9/02*
U.S. Cl. 350—189 **6 Claims**

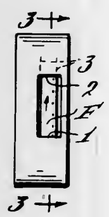


A lens of large diameter and short focal length comprises a plurality of interengageable elements which are moulded in a transparent material, or in transparent materials having the same refractive index. The elements are interengaged to constitute the required lens.

3,580,664
TRANSMISSION ELEMENT FOR MAGNETO-OPTICAL APPLICATIONS, PARTICULARLY FOR THE MODULATION OF INFRARED RADIATION IN THE WAVELENGTH RANGE BETWEEN 1 AND 20 MICRONS
Piet Frans Bongers, and Giulio Zanmarchi, both of Emmasingel Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 7, 1969, Ser. No. 789,506
Claims priority, application Netherlands, Jan. 11, 1968, 6800387
Int. Cl. G02f *1/22*
U.S. Cl. 350—320 **4 Claims**

A novel magneto-optical transmission element consisting of a substrate transparent to radiation in the wavelength range between 1 and 20 microns having thereon a monocrystalline or polycrystalline layer of a material having a spinel structure, a magnetic permeability, in vacuo, $\mu_0 = B/H$ exceeding 1.2 at temperatures lower than the Curie point, i.e. the material is either ferromagnetic or ferrimagnetic, a resistivity at the Curie point exceeding 100 ohm-cm and a chemical composition having the formula A Cr_2Z_4, Z being selenium, sulfur, or telluorium and A being in general a divalent metal or complex, preferrably cadmium. The transmission element may also serve as a memory element in which information therein can be read out by determining the sign of the remanent magnetization thereof by means of polarized infrared radiation.

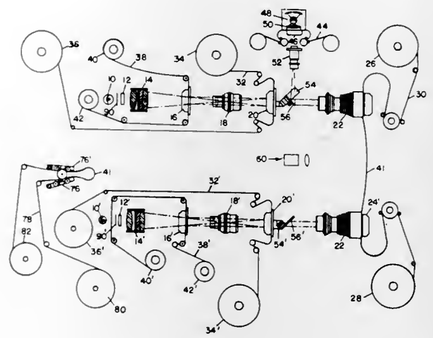
3,580,665
METHOD FOR REMOVING FILM FROM A FILM CARTRIDGE
Marvin Ben Bassett, Randolph, Mass., assignor to Technicolor, Inc., Hollywood, Calif.
Filed Apr. 18, 1968, Ser. No. 722,399
Int. Cl. G03b *23/02*
U.S. Cl. 352—78 **1 Claim**



Peeling back an edge of the cartridge exposure window far enough to relieve the film from any pressure or friction from the pressure plate and the edge of the exposure window, so that the film may be pulled obliquely from the cartridge without being scratched.

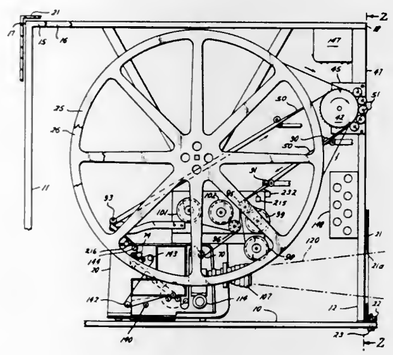
3,580,666
OPTICAL PRINTER FOR MOTION PICTURE FILM
Robert G. Vance, 8312 Frye Road, Alexandria, Va.
Filed July 31, 1969, Ser. No. 846,422
Int. Cl. G03b *21/32, 27/32*
U.S. Cl. 352—90 **22 Claims**

An optical printer for superimposing titles or the like on motion picture film in which images from picture, title and title shadow matte rolls are projected onto raw film stock in a continuous operation. A cue roll provides for automatic advancement of this title and title-shadow matte and title rolls and also enables variations in light intensity and fade-in and fadeout to be effected. A second printing unit operated by



the cue roll provides for lap dissolve and checkerboarding in coordinated time relationship with the first printer.

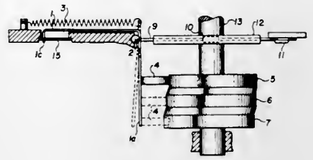
3,580,667
ENTERTAINMENT SYSTEM
Robert D. Moore, Houston, Tex., assignor to Kenneth F. Faukner, Kemah, Tex., a part interest
Filed Oct. 9, 1968, Ser. No. 766,093
Int. Cl. G03b *21/02, 21/43, 29/00*
U.S. Cl. 352—124 **8 Claims**



Entertainment system including movie projection apparatus having enlarged film storage capacity, whereby multiple full length movies may be stored and shown in any sequence, and which is constructed as a unit for installation and use in passenger carriers such as aircraft, or in other places where space is limited.

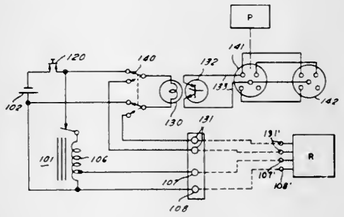
3,580,668
CONTROL MECHANISM FOR MOTION PICTURE PROJECTOR
Hermann Claar, Stuttgart-Hedelfingen, Germany, assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Oct. 4, 1968, Ser. No. 765,112
Claims priority, application Germany, Oct. 7, 1967, K59048
Int. Cl. G03b *21/12, 1/22*
U.S. Cl. 352—194 **3 Claims**

A driving arrangement for the film claw of a motion picture projector comprises a plurality of radial cams which rotate in synchronism on a common axis to selectively effect



various modes of up-and-down and in-and-out movement of the claw.

3,580,669
FILM-SOUND SYNCHRONIZING SYSTEM
Robert S. Beeler, Brighton, N.Y., assignor to Eastman Kodak Company,, Rochester, N.Y.
Filed Oct. 2, 1968, Ser. No. 764,558
Int. Cl. G03b *31/00*
U.S. Cl. 353—15 **9 Claims**

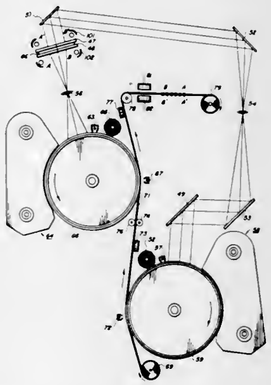


A unit for synchronizing a sound recording with photographic projection employing an audible device to record a signal. A light responsive to the recorded signal in playback actuates a photoswitch coupled with a projector advance mechanism to operate the projector.

ERRATUM

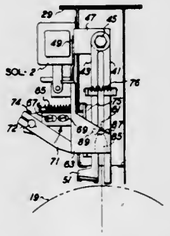
For Class 353—122 see:
Patent No. 3,580,660

3,580,670
APPARATUS FOR DUPLEXING
Gopal C. Bhagat, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Aug. 12, 1968, Ser. No. 751,986
Int. Cl. G03b *27/32*
U.S. Cl. 355—3 **12 Claims**



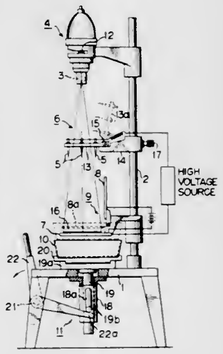
A apparatus for duplex printing by forming on the surface of a first plate an electrostatic latent image conforming to the information to be placed on the first side of a support material, then forming on the surface of a second plate an electrostatic latent image conforming to the information to be placed on the opposite side of the support material, developing the latent images, and transferring the developed image on each plate to its respective side of support material.

3,580,671
EXPOSURE APPARATUS
Edward J. Lavander, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.
Filed Oct. 24, 1968, Ser. No. 770,367
Int. Cl. G03g *15/04*
U.S. Cl. 355—3 **5 Claims**



Improved exposure apparatus for use in electrostatic recording machines in which continuous tone and solid area images or line images are produced automatically at the option of the machine operator. The exposure apparatus comprises two exposure slits, each of which is adapted for movement into and out of the optical path in response to discrete electrical signals. One slit is open and used for line images. The other slit is provided with transparent and opaque lines and is used for producing tonal and solid area images.

3,580,672
ELECTROSTATIC PHOTOCOPYING APPARATUS
Sadanao Ando, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan
Filed Nov. 4, 1968, Ser. No. 773,167
Claims priority, application Japan, Nov. 14, 1967, 73193/67
Int. Cl. G03g *15/10*
U.S. Cl. 355—3 **4 Claims**

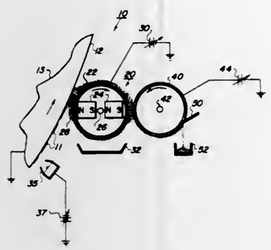


An electrostatic photocopying apparatus having a corona discharge device positioned vertically between a projection optical unit and a copying paper stand which is associated with a developer solution container. The distance between the corona discharge device and the copying paper is maintained sufficiently large to create a weak corona discharge, and the corona discharge device is swingable out of the vertical line to allow operation of the optical unit.

3,580,673
CLEANING APPARATUS

Frank Y. Yang, Webster, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Aug. 26, 1968, Ser. No. 755,266
Int. Cl. G03g *15/00*
U.S. Cl. 355—15 **14 Claims**

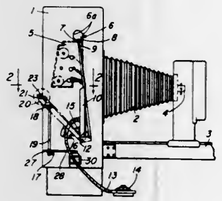


A method and apparatus for cleaning the residual toner image from an electrostatic recording surface for reuse in the imaging system. This is accomplished by contacting the electrostatic recording surface to be cleaned with an electrically insulating magnetic cleaning material which is moved on a transport into sweeping contact with the residual image. An electrical potential is applied to the transport of opposite polarity to the residual image and of a magnitude sufficient to pull the residual image onto the magnetic cleaning material which wipes the residual image enabling mechanical as well as electrostatic forces to remove the residual image. The residual image is removed from the magnetic cleaning material by contacting it with an electrically biased member which is connected to a voltage potential of sufficient magnitude to remove the image from the cleaning material onto the surface of electrical biasing member ensuring continuous removal of the residual image for subsequent reuse in the imaging system.

3,580,674
DEVICE FOR FAST REMOVAL OF EXPOSED FILM FROM THE SUCTION BOARD OF PROCESS CAMERAS AND DELIVERY TO A SUBSEQUENT PROCESS STATION

Kurt Schunck, and Waldemar Baunach, Frankfurt, Germany, assignors to Klimsch & Co.,, Frankfurt Main, Postfach, Germany

Filed Nov. 19, 1968, Ser. No. 777,037
Int. Cl. G03b *29/00*
U.S. Cl. 355—28 **9 Claims**

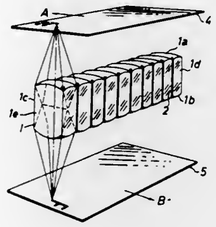


A device for the speedy removal of exposed light sensitive material such as films, foils, or papers from an appropriate holder in the exposure plane of a process camera, the holder being incorporated in the camera back in such a way that it may be moved out of the exposure plane to a position where the exposed film can be engaged by automatic gripper means and delivered for the automatic transport to a subsequent processing station.

3,580,675
STRIP SCANNING COPYING APPARATUS

Fritz Hieber, Grunwald, Munich; Erich Burger, Unterhaching, and Hans-Peter Huber, Munich, all of, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 25, 1968, Ser. No. 778,854
Claims priority, application Germany, Nov. 27, 1967, A57,493
Int. Cl. G03b *27/50*
U.S. Cl. 355—50 **18 Claims**

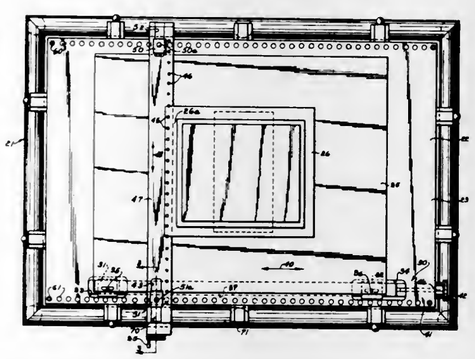


Strip portions of an original are successively scanned by a row of lenses with toric refractive surfaces having a first radius of curvature in the scanning direction and a second smaller radius of curvature in a transverse direction. The first and second radii are selected so that the image of a part of the scanned strip-shaped portion projected by each lens is reversed in the scanning direction only, and not reversed in the transverse direction of the row of lens means the exposed strip-shaped portions of the copy sheet form together a continuous complete legible image of the original.

3,580,676
ART OF PLATE MAKING

Albert J. Sarka, Fairview Park, Ohio, and Trevor H. Blake, Naperville, Ill., assignors to Harris-Intertype Corporation, Cleveland, Ohio, by said Sarka and American Can Company, New York, N.Y., by said Blake

Filed July 5, 1967, Ser. No. 651,298
Int. Cl. G03b *27/04*
U.S. Cl. 335—86 **13 Claims**

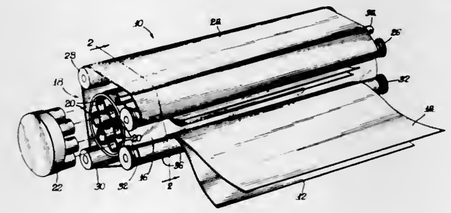


An apparatus for use in making a pair of plates having cooperating metal-forming projections thereon includes a support table. The support table has first and second plate supporting surfaces located on the opposite sides thereof. Means is provided for supporting the table for movement from a first position wherein the first surface of the table is located to support one of the plates and a second position wherein the second surface of the table is located to support the other of the plates. A chase carrier is adapted to be located overlying each of the plates located on the table. A chase for carrying a negative is carried by the chase carrier. Means is provided for moving the chase and each plate relatively in transverse directions to accurately locate the chase and plates.

3,580,677
EXPOSURE APPARATUS FOR COPY MAKING MACHINES EQUIPPED WITH LIGHT REFLECTIVE CONVEYOR

Terrance G. Seelenbinder, Rolling Meadows, Ill., assignor to Addressograph-Multigraph Corporation, Mount Prospect, Ill.

Filed Sept. 16, 1968, Ser. No. 759,939
Int. Cl. G03b *27/10*
U.S. Cl. 355—110 **2 Claims**

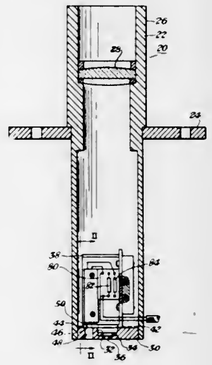


An exposure apparatus for copy making machines includes a light source within a light transmitting drum. A flexible endless belt is trained around a portion of the drum, and superimposed original and copy sheets are carried around the drum between the belt and the drum for exposure of the copy sheet in accordance with an image on the original. The amount of light in the exposure area is increased by providing the belt with a light reflecting surface.

3,580,678
OPTICAL PYROMETERS

Terrance S. Roman, Latrobe, Pa., assignor to Cross Electronics, Inc., Wexford, Pa.

Filed Dec. 18, 1968, Ser. No. 784,647
Int. Cl. G01j *5/48*
U.S. Cl. 356—43 **14 Claims**

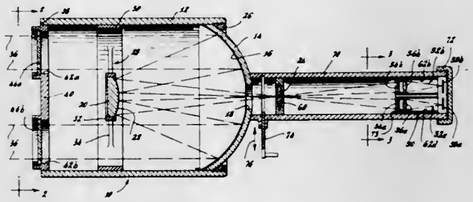


I disclose, in an optical pyrometer system, the combination comprising an optical system for receiving and focusing incident radiation from an object, a beam splitter disposed in a light path of said optical system, for passing a portion of said incident radiation to a direct viewing aperture of said optical system and the remainder of said incident radiation to a second aperture of said optical system, light sensitive detecting means juxtaposed to said second aperture for receiving incident radiation passing therethrough, and said direct viewing aperture and said second aperture being sized so that the light sensitive area of said detecting means is completely covered by said second aperture radiation when an object image focused by said optical system completely fills said direct viewing aperture.

3,580,679
SOLAR SPECTROGRAPHS

Richard S. Perkin, New Canaan, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sept. 24, 1968, Ser. No. 761,988
Int. Cl. G01j *3/36*
U.S. Cl. 356—76 **7 Claims**

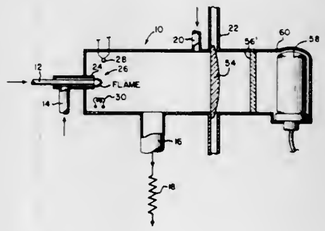


In certain astronomical applications, it is desirable to photograph (or otherwise observe) a celestial body (e.g., spectroheliograms of the sun) at a very narrow spectral bandwidth (i.e., substantially monochromatically). It is proposed to modify an otherwise conventional astronomical telescope so as to allow the simultaneous photographing (or other recording) of, for example, the sun at a plurality of different extremely very narrow wave bands (i.e., discrete, substantially monochromatic spectroheliograms). This may be accomplished by providing a series (say, four) of discrete apertures at the entrance end of an otherwise conventional telescope; and means at the image or exit end of the telescope for separately forming an image from each of the four separate entrance beams. By providing different narrow band-pass filters (or other means for rendering each of the beams monochromatic at a different wavelength), a simultaneous photograph (or other measurement) of the sun at different spectral lines may be made. Comparison of such simultaneous photographs can yield information concerning relative intensity of spectral lines from any part of the sun, free from uncertainty due to, for example, the fluctuating intensity with time of the source (e.g., the sun) itself. Preferably the entrance apertures are provided with moderately broad-pass reflecting filters for rejecting (i.e., reflecting away) most of the radiant energy outside of the vicinity at which each of the separate spectral measurements are being made.

3,580,680
FLAME EMISSION INSTRUMENT FOR SELECTIVELY MONITORING METAL AEROSOLS

Walter Leslie Crider, Cincinnati, Hamilton, Ohio, assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare

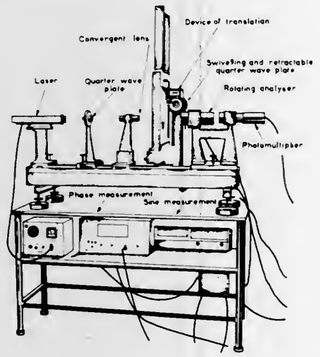
Filed May 6, 1969, Ser. No. 822,191
Int. Cl. G01j *3/30, 3/48*
U.S. Cl. 356—87 **6 Claims**



An instrument employing the principle of flame emission spectrophotometry is provided to selectively monitor the

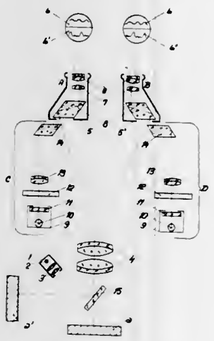
mass concentration of Fe_2O_3 aerosol in animal exposure chambers. The instrument is calibrated over the range from 0.3 to 1.6 milligrams per cubic meter, and the maximum sensitivity is found to be about 3 micrograms of Fe_2O aerosol per cubic meter of air.

3,580,681
APPARATUS FOR AUTOMATICALLY MEASURING THE PROPERTIES OF ELLIPTICALLY POLARIZED LIGHT
Andre Robert, Paris; Claude Bourdon, Montrouge, and Jean Luc Le Goer, Paris, all of, France, assignors to Etat Francais representa par le Ministre des Armees, Delegation Ministerielle pour l'Armenment, Paris, France
Filed Sept. 27, 1968, Ser. No. 763,325
Claims priority, application France, Sept. 28, 1967, 122,613
Int. Cl. G01n *21/40*
U.S. Cl. 356—114 **6 Claims**



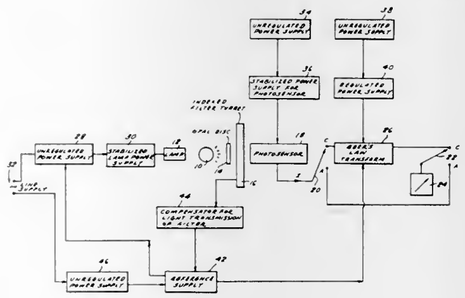
An apparatus for measuring the output of a photomultiplier tube energized by the output of a rotating analyzer which is in the path of a polarized light beam. The AC component of the output signal is compared to a reference signal whose frequency corresponds to twice the rotation rate of the analyzer and the phase difference between the two signals provides the spatial orientation of the polarized light. The amplitude of the AC component is proportional to the phase retardation of the polarized beam components. The DC component of the photomultiplier output is used to control the gain of the photomultiplier.

3,580,682
METHOD AND STEREOSCOPIC OPTICAL APPARATUS FOR DETERMINING THE ROUGHNESS OF THE SURFACES OF MACHINED PARTS
Liviu Iliescu, and Ion Dragos, Bucharest, Romania, assignors to Ministerul Industriei Constructillor De Masini, Bucharest, Romania
Filed Oct. 30, 1967, Ser. No. 678,805
U.S. Cl. 356—168 **1 Claim**



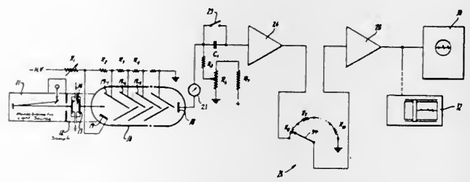
A method and apparatus for stereoscopically determining the roughness of the surfaces of machined parts. A stereoscopic viewing means is provided for presenting to the operator stereoscopic images of the surface of a machined part, and simultaneously stereoscopic images of gauge surfaces, so that a comparison of the surface of the machined part with the surface of the gauges can be made. A projecting means is provided for projecting to the stereoscopic viewing means an image of the machined surface which is to be checked, while a pair of projecting means coact with a pair of gauges to project separate images thereof respectively to a pair of ocular means of the stereoscopic viewing means so that in this way images of the gauges are provided for the operator to be viewed simultaneously with the stereoscopic images of the surface of the machined part.

3,580,683
COMPUTING COLORIMETER
Herbert Schulkind, Laurelton, N.Y., assignor to Photovolt Corporation, New York, N.Y.
Filed Jan. 14, 1969, Ser. No. 791,070
Int. Cl. G01j *3/48*
U.S. Cl. 356—184 **10 Claims**



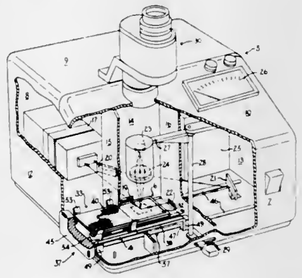
A colorimeter with a computing circuit by which the concentration of a sample fluid is linearly indicated. Light transmitted through a sample vial of the fluid is directed upon a photosensing device which provides an electrical signal corresponding to the intensity of a transmitted light. The electrical signal from the photosensing device is applied to a computing circuit which transforms the applied electrical signal into one linearly related to the concentration of the fluid under investigation. The output of the computing circuit deflects a current indicating device so that the deflection of this device is proportional to the concentration of the fluid.

3,580,684
OPTICAL DENSITY-CALIBRATED PHOTOMETER
Ernest S. Gordon, 12176 Terrence, Saratoga, Calif.
Filed Apr. 14, 1967, Ser. No. 631,061
Int. Cl. G01j *1/44*
U.S. Cl. 356—226 **8 Claims**



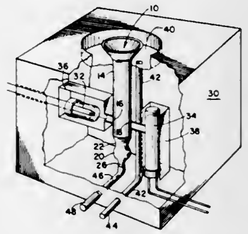
A system in which changes in the optical density of a sample are measured by passing a light beam through the sample including a photomultiplier for intercepting the exit beam and providing an electrical signal corresponding to its intensity. An adjustable high voltage source is used to adjust the output voltage of the photomultiplier circuit to a predetermined reference level. An amplifier network and voltage divider having stepped positions calibrated to directly indicate changes in optical density per volt of output couples the voltage to a fixed gain (volt/cm) oscilloscope or recorder so that change in optical density is directly related to the displacement of the oscilloscope or recorder trace.

3,580,685
MEANS FOR EXPOSING NORMALLY COVERED PLATE WHILE MOVING IT TO EXPOSURE SITUATION
Gustave Ragnar Eriksson, Jonkoping, Sweden, assignor to Saab Aktiebolag, Linkoping, Sweden
Filed Nov. 25, 1968, Ser. No. 778,573
Int. Cl. G01n *21/16*
U.S. Cl. 356—244 **4 Claims**



A specimen plate having a lengthwise slidable cover is placed on a carriage to move therewith into and out of an isolation chamber. A cover holder, movable in and out both relative to the carriage and with it, detachably retains the cover and prevents it from moving with the carriage beyond predetermined limits, so that the specimen plate is slid out of the cover and exposed while moving into the isolation chamber with the carriage, and is slid back into the cover as it is moved out of the isolation chamber.

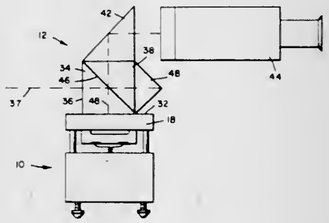
3,580,686
VESSEL HAVING INTERSAMPLE ANTICONTAMINATION CONSTRUCTION
Wallace H. Coulter, Miami Springs, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.
Filed Mar. 17, 1969, Ser. No. 807,737
Int. Cl. G01n *1/10, 21/16*
U.S. Cl. 356—246 **5 Claims**

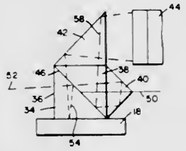


A vessel particularly constructed to separate each of a sequence of liquids, such that each liquid is free of intersample contamination by a prior liquid. Such contamination, which could be caused by residue of the prior liquid adhering to the walls of the vessel, particularly near its drain, or because of inadvertent liquid or gas bubble backflow from the drain, is obviated by an isolation chamber interposed between a primary chamber of the vessel and its drain. A necked passageway or surface of connection between the two chambers is of such proportions that pressure differentials and surface tension hold a major portion of the fluid in the primary chamber and create a gas barrier between the two chambers.

A preferred embodiment of the improved vessel is useful as a cuvette in making hemoglobin determinations and includes a housing having an integral overflow reservoir, drain, and receptacles for radiant energy transmitting and receiving apparatus.

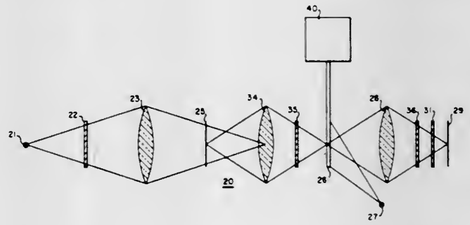
3,580,687
SURVEY LEVEL
Siegfried Hansen, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Feb. 20, 1969, Ser. No. 800,970
Int. Cl. G01c *9/24*
U.S. Cl. 356—248 **8 Claims**





As level reference, the survey level incorporates an optical flat equipped with a leveling servo so that the optical flat is maintained accurately perpendicular to the direction of local gravity. Optics include an image rotating prism and a beam splitter arranged so that light from a target is split, part of it is reflected from the horizontal surface of the optical flat and the images are compared. When they horizontally correspond, the target is in the horizontal survey level reference plane. When the target is off that plane, two vertically displaced images are seen.

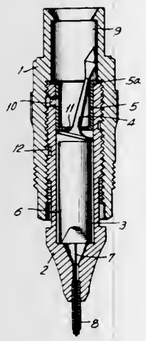
3,580,688
INFORMATION STORAGE WITH OPTIC MATERIALS
Irwin Schneider, 2402 Daphne Lane, Alexandria, Va.
Filed Feb. 26, 1968, Ser. No. 708,299
Int. Cl. G02b *27/28;* **G02f** *1/16*
U.S. Cl. 356—256 **8 Claims**



Anisotropic color centers, such as the M_A center in optical materials like sodium doped potassium chloride crystals, are used for the storage of information. The color centers are first oriented in a common lattice direction with polarized light, and information is then stored by effectively causing reorientations of the color centers with radiation of the same wavelength but of altered polarity. The information is read with polarized light at a second longer wavelength. Optical materials are particularly useful for computer storage elements since they have a substantially greater information storage capacity than conventional magnetic core memories.

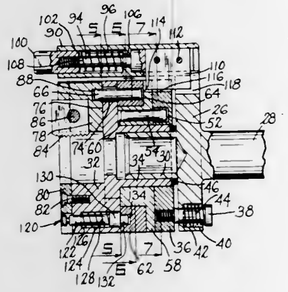
Apparatus employing the optical storage material is also disclosed.

3,580,689
TUBULAR WRITING HEAD FOR A TUBULAR WRITING PEN
Helmuth Riepe, Hamburg, Germany, assignor to Rapidograph, Inc., Bloomsbury, N.J.
Filed Nov. 18, 1968, Ser. No. 776,370
Claims priority, application Germany, Nov. 24, 1967, P 16 11 558.5
Int. Cl. B43k *1/10*
U.S. Cl. 401—258 **3 Claims**



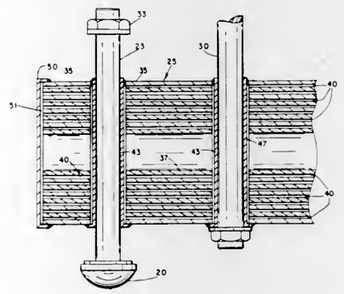
The present invention is directed to a tubular writing head of a tubular writing pen, wherein the tubular writing head comprises a hollow cylindrical member having a writing tube mounted at one end thereof and the interior thereof containing a drop weight with a hair wire which extends through the tube. A loading member in the form of a mushroom-shaped member is also disposed within the interior of the hollow cylindrical member and acts upon the drop weight so as to cause the hair wire to extend through the tube even when the tubular writing pen is not held in a vertical position.

3,580,690
INSERT CHASER DIE HEAD
Arthur A. McClure, Orange, Conn., assignor to Michael Cerrito, New Haven, Conn.
Filed June 9, 1969, Ser. No. 831,601
Int. Cl. B23g *1/00, 5/12*
U.S. Cl. 408—178 **17 Claims**



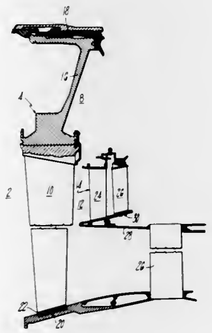
An insert chaser die head having a main frame member to which is attached a control plate having at least one guiding groove on its front face and rotating plate means positioned adjacent said control plate. The rotating plate means has at least one bore therein for supporting an actuating pin member whose end travels in the guiding groove and is biased by a spring located in the groove. At least two more bores are formed in the rotating plate for supporting at least two driven pin members, so that a portion of the ends of the pin members protrude from the rotating plate means. A stationary body member mounted adjacent the rotating plate means has at least two channels for slidably supporting at least two carrier members which, in turn, support individual chasers for cutting threads on workpieces. Individual guideways communicating with each channel are formed in the body member to permit the ends of the driven pin members to pass therethrough and engage cam grooves in the carrier members such that, upon rotation of the rotating plate means, the carrier members are moved toward or away from each other.

3,580,691
VIBRATION ABSORBING THROTTLE LIFT BAR
Charles C. Czuszak, Greensburg, Pa., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Nov. 24, 1969, Ser. No. 879,473
Int. Cl. F01b *25/02;* **F01d** *17/12;* **F03b** *1/04*
U.S. Cl. 415—155 **2 Claims**



A vibration absorbing throttle valve lift bar arrangement for steam or gas turbines. A plurality of tubular members are nested concentrically one within the other. The assembly is provided with diametrically disposed bushings to slidably receive the lift bar rods and the valve stems. The tubes are dimensioned to have clearance between them. Preferably, a closure cap is sealed to the ends of the outer tube, and the inner tubes have end clearance with the caps.

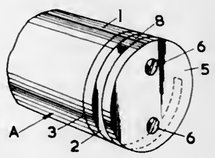
3,580,692
SEAL CONSTRUCTION
Alojzy Mikolajczak, Hartford, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed July 18, 1969, Ser. No. 843,114
Int. Cl. F01d *11/08*
U.S. Cl. 415—174 **1 Claim**



A seal construction of the honeycomb type for turbomachinery, the cell geometry of the honeycomb being

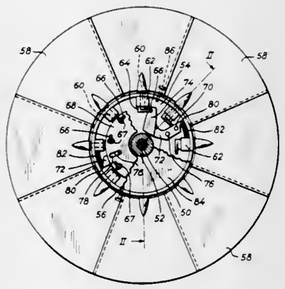
selected and arranged to provide an increase in boundary layer stability and an improvement in overall compressor or turbine performance.

3,580,693
BOUNDARY LAYER CONTROL DEVICES
Ian Clifford Cheeseman, Camberley, and Michael Charles George Smith, Farnham, England, assignors to Minister of Technology in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England
Filed Mar. 17, 1969, Ser. No. 808,386
Claims priority, application Great Britain, Mar. 22, 1968, 13885/68
Int. Cl. B64c *27/18*
U.S. Cl. 416—90 **10 Claims**



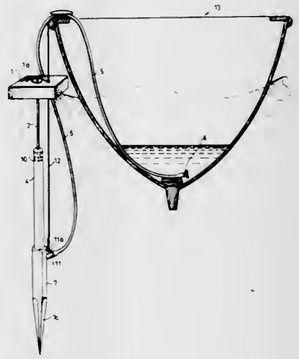
A rotor blade on which lift is induced by circulation control is provided with a chordwise extending slot at the blade tip formed by a plate spaced from the tip by a distance piece extending around part of the blade periphery towards the rear of the blade, i.e., the slot extends around the front and under part of the blade for about 240°. Air blown from the interior of the blade into the slot is discharged radially as a sheet which forms a pneumatic fence and thus modifies flow over the blade tip. The normal tip vortex can be moved radially outwards relative to the blade root and an appreciable drag reduction obtained. In a variation, air is discharged spanwise relative to the blade.

3,580,694
COMBINED FLUID IMPELLERS AND SELF-SEALING CLOSURES
Ole Stig Andersen, Virum, and Ove Rathje, Vanlse, Denmark, assignors to F. S. Andersen, ingenior-og maskinforretning I/S, Vedbak, Denmark
Filed Apr. 7, 1969, Ser. No. 813,912
Claims priority, application Denmark, Apr. 8, 1968, 1559/68
Int. Cl. F01d *7/02*
U.S. Cl. 416—136 **2 Claims**



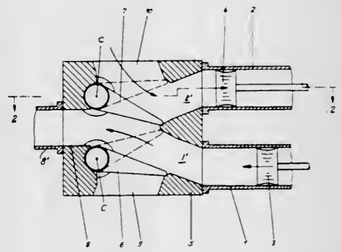
A combined fluid impeller and self-sealing closure has a plurality of blades mounted on the periphery of a rotor ring for pivotal movement about a radial axis. The blades are arranged so that they are in overlapping, sealing relationship with respect to one another when the impeller is at rest, and are in an open, impelling position when the impeller is rotating. The blades are opened by means of weights arranged in the rotor ring which are moved by centrifugal force when the impeller is rotating and rotates a control member arranged inside the rotor ring which in turn rotates the blades to their open position.

3,580,695
BILGE PUMP FOR BOATS
Sven O. G. Tumba, Vartavagen 8 E, 183 63 Hollviksnas, Sweden
Filed Mar. 12, 1969, Ser. No. 806,613
Int. Cl. F04b *35/00;* **F16j** *15/18*
U.S. Cl. 417—330 **7 Claims**



A bilge pump for boats driven by wave movements, the pump being supported from a boat on the end of a line and being entirely immersed in the water a short distance under the surface thereof. The pump as a float connected by means of a rod with a pump piston slidably mounted in a pump cylinder. The wave movements or the rolling of the boat causes the float to move the pump piston upwards and downwards within the cylinder. The wave movements or the rolling of the boat causes the float to move the pump piston upwards and downwards within the cylinder. The induction end of the cylinder is connected to a hose placed in the bilge of the boat for pumping out bilge water, the hose on its inboard end being provided with a nonreturn valve for preventing any backflow. Another nonreturn valve permits the water in the hose to be expelled out into the water surrounding the pump.

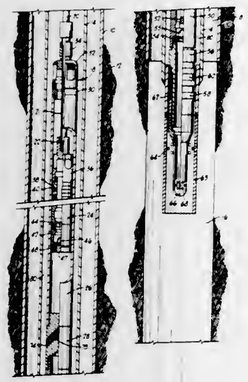
3,580,696
CONCRETE PUMP ASSEMBLY
Friedrich Schwing, Rathausstrasse 126, 468 Wanne-Eickel, Germany
Filed Apr. 18, 1969, Ser. No. 817,480
Int. Cl. F04b *1/00, 21/02, 15/02*
U.S. Cl. 417—515 **1 Claim**



Concrete pump assembly regulated by control flap valves with two pump cylinders and a common outlet opening. On two sides of the outlet opening in a control housing is a pair

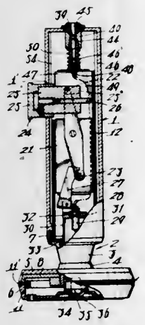
of control flap valves, which are rockable about their axes and alternately connect one of the two pump cylinders with the outlet opening and at the same time connect the other pump cylinder with a suction opening.

3,580,697
PUMP
John O. Youngblood, Rt. 1, Lamont, Okla.
Filed Apr. 23, 1969, Ser. No. 818,640
Int. Cl. F04b *21/00*
U.S. Cl. 417—557 **6 Claims**



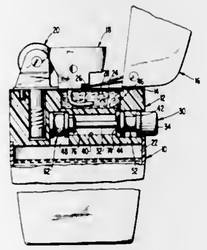
A pump for use in oil wells which includes an elongated production tubing, a working barrel positioned within the production tubing, a special orificed sub connected to the lower end of the working barrel, a standing valve cage connected to the special orificed sub, and a holddown shoe connected to the standing valve cage and engaging the production tubing. A plunger carrying a traveling valve is reciprocably mounted in the working barrel and connected at its upper end to a sucker rod string. The special ofificed sub is positioned immediately above the standing valve of the pump and has a bore therethrough which is radially offset from the axis of the aligned bores through the standing valve and the working barrel. Communicating with the bore through the special orificed sub is an orifice which extends upwardly and inwardly from the outside of the special sub.

3,580,698
LIQUEFIED GAS-FUELED SMOKING LIGHTER UTILIZING PIEZO-ELECTRIC ELEMENTS AS THE VOLTAGE GENERATION SOURCE
Kenjiro Goto, Setagaya-ku, Japan, assignor to Mansei Kogyo Kabushiki Kaisha, Kawaguchi, Saitama, Japan
Filed Aug. 26, 1969, Ser. No. 853,068
Claims priority, application Japan, Sept. 11, 1968, 43/78712
Int. Cl. F23q *3/01*
U.S. Cl. 431—255 **8 Claims**



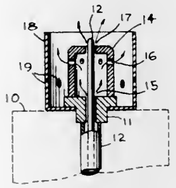
A liquefied gas-fueled smoking lighter utilizing piezoelectric elements as the voltage generation source comprising a casing, a support frame structure disposed within and secured to said casing, a high voltage generation unit comprising piezoelectric elements received in said frame structure and pinched at their opposite ends by a pressure transfer plate and a washer, an eccentric cam disposed on said pressure transfer plate for applying a pressure to said piezoelectric elements, a valve manipulation lever fixedly mounted on the shaft of said cam and having said cam shaft as the axis of rocking movement, and a valve opening and closing member disposed adjacent to said lever with at least a portion of said member positioned in the path of rocking movement of said lever.

3,580,699
FUEL TRANSFER SYSTEM FOR CIGARETTE LIGHTERS
Harry L. Vaughan, Lawrenceville, Ga., assignor to Scripto, Inc., Atlanta, Ga.
Filed Jan. 22, 1969, Ser. No. 793,100
Int. Cl. F23d *3/18*
U.S. Cl. 431—321 **7 Claims**



The fuel reservoir of a cigarette lighter is indirectly connected to the wick chamber by a transfer mechanism which dispenses a controlled amount of fuel to the wick chamber even if the fuel reservoir is under greater pressure than is the surrounding atmosphere.

3,580,700
BURNER FOR CIGARETTE LIGHTER
Thayer C. Hinckley, Inglewood, Calif. (P.O. Box 37218, Los Angeles, Calif. 90037)
Filed Nov. 27, 1968, Ser. No. 779,493
Int. Cl. F23d *13/04*
U.S. Cl. 431—344 **6 Claims**



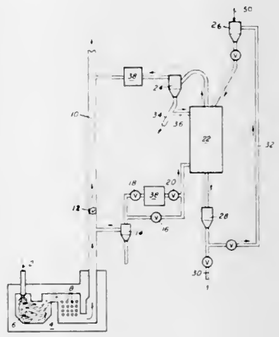
A burner for a gas fuel cigarette lighter is disclosed which provides a distributor to produce a plurality of gas jets, and an outer shield arranged so that a circular flame is produced which is windproof. This burner structure prevents deposition of carbon around the valve stem, due to incomplete combustion of the fuel, and avoids cleaning and repair.

CHEMICAL

3,580,701
PROCESS FOR PRODUCING SHRINK-RESISTANT WOOL BY TREATMENT WITH HYPOCHLOROUS ACID AND CATIONIC HYDROPHILIC RESINOUS CONDENSATION PRODUCT
Dennis Wray, Belper, and Janet M. Johnson, Duffield, England, assignors to Precision Processes (Textiles) Limited, Ambergate, Derbyshire, England
No Drawing. Filed July 27, 1967, Ser. No. 656,339
Claims priority, application Great Britain, July 29, 1966, 34,288/66
Int. Cl. D06m *15/36*
U.S. Cl. 8—127.6 **13 Claims**

In the shrink-proofing of wool it has been found that a product having an exceptionally valuable combination of properties e.g. handle, flexural properties, tensile strength, resilience and elasticity is obtained when woollen materials are first subjected to a uniform treatment with hypochlorous acid at an acid pH, the treatment being limited to that which will reduce the shrinkage under standardised washing conditions by 15–80%, then impregnated with a water-soluble cationic hydrophilic resinous condensation product containing polyoxyalkylene groups in the molecule and finally heating the wool when impregnated with said condensation product.

3,580,702
METHOD OF REMOVING SULFUR OXIDES FROM GASES
John G. Myers and Joseph H. Field, Pittsburgh, Pa., assignors to the United States of America as represented by the Secretary of the Interior
Filed Sept. 10, 1968, Ser. No. 758,723
Int. Cl. B01d *53/34*
U.S. Cl. 23—25 **5 Claims**



Sulfur oxides are removed from gases by contacting the same at elevated temperatures with a dry absorbent selected from the group consisting of red mud, retorted oil shale, retorted oil shale treated with sodium hydroxide and mixtures of retorted oil shale and red mud treated with sodium hydroxide. These absorbents may be used on a once-through basis or they may be regenerated. Catalytic oxidation of the gases, though not necessary, may precede contact with the absorbents.

3,580,703
PROCESS FOR THE PURIFICATION OF RESIDUAL GYPSUM FORMED IN THE MANUFACTURE OF PHOSPHORIC ACID BY THE ACTION OF SULPHURIC ACID ON NATURAL PHOSPHATES
Engelhard Pavonet, Chokier, Belgium, assignor to Fosindus Company, Willemstad, Curacao, Dutch Antilles
Continuation-in-part of abandoned application Ser. No. 434,834, Feb. 24, 1965. This application Feb. 27, 1969, Ser. No. 802,890
Claims priority, application France, Feb. 27, 1964, 965,314
Int. Cl. C01f *11/46*
U.S. Cl. 23—122 **14 Claims**

A process is provided for the purification of residual gypsum formed in the manufacture of phosphoric acid by the sulphuric acid reaction on natural phosphates, the gypsum into coarse calcium sulfate hemihydrate crys- and phosphoric acids and continuously fed into an autoclave and treated therein at 105–150° C. to recrystallize the gypsum into coarse calcium sulfate herihydrate crystals in the presence of a large amount of hemihydrate crystals already present in the autoclave, and recover P_2O_5. The slurry is continuously withdrawn from the autoclave and the hemihydrate is separated from the liquid.

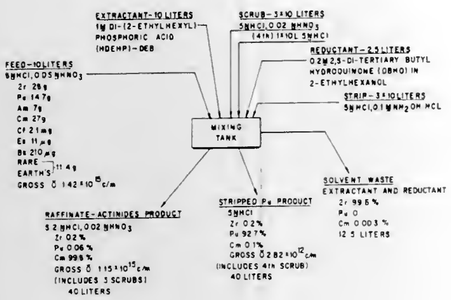
3,580,704
COLORIMETRIC INDICATORS FOR DETERMINING pH OF MOTOR OIL
John Pickup, Montreal, and Theodorus G. Brandts and Joseph A. Lichtenberger, Grand'Mere, Quebec, Canada, assignors to Consolidated Paper (Bahamas) Limited, Nassau, Bahamas
No Drawing. Filed Mar. 6, 1967, Ser. No. 620,683
Claims priority, application Canada, Mar. 10, 1966, 954,427
Int. Cl. G01m *21/08, 31/22, 33/26*
U.S. Cl. 23—230 **7 Claims**

The pH of a non-aqueous system which, normally, on contact of a pH color indicator, does not show a detectable change in the color of this indicator, is colorimetrically measured by use of a treated solid adsorbent carrier containing adsorbed thereon a suitable pH color indicator and a non-aqueous, substantially non-volatile liquid solvent common to said indicator and said system, by bringing the non-aqueous system in contact with the carrier. In a preferred embodiment, a method of indicating the pH of a motor oil is described which consists in contacting the used motor oil with a paper which has previously been treated with a pH colour indicator soluble in a non-ionic solvent and a surface-active agent which is a non-ionic solvent for said indicator and said motor oil.

3,580,705
SELECTIVE STRIPPING OF PLUTONIUM FROM ORGANIC EXTRACTS
Charles Coleman and Boyd S. Weaver, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed Oct. 2, 1968, Ser. No. 764,494
Int. Cl. B01d *11/00;* **C01g** *56/00*
U.S. Cl. 23—341 **5 Claims**

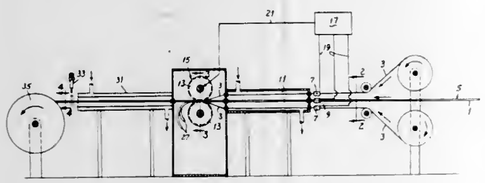
Dialkyl substituted hydroquinones dissolved in an organic solvent have been found effective in reducing plutonium in the +4 and +6 oxidation states dissolved

in diesters of orthophosphoric acids such as di(2-ethylhexyl) phosphoric acid to the +3 oxidation state. This



enables quantitative stripping of the plutonium with aqueous solutions of hydrochloric acid.

3,580,706
METAL STRAND HAVING A CHROMIUM STEEL CORE AND CORROSION-RESISTANT CLADDING
Gerald H. Frieling, Jr., Barrington, R.I., assignor to Texas Instruments Incorporated, Dallas, Tex.
Original application May 3, 1965, Ser. No. 452,767, now Patent No. 3,372,465. Divided and this application Dec. 28, 1967, Ser. No. 694,222
Int. Cl. B32b *15/00*
U.S. Cl. 29—196.3 **6 Claims**



An austenitic chromium steel core, from the surface of which chromium oxide has been removed, in a cleaning solution is back-plated in the solution with a solid-phase bondable chromium-free metal, such as copper or a precious metal such as, for example, silver, gold or the like. Clean strips of a cupronickel alloy or titanium are positioned on opposite sides of the plated core and moved through a reducing atmosphere, and thence directly into the bite between squeezing rolls. The core and strips are rapidly heated in their passage through the reducing atmosphere. The rolls squeeze the strips around the plated core to effect solid-phase bonding between the strips and the plating. The margins of the strips are also squeezed together and become solid-phase bonded to one another. Upon emergence of the clad material from the rolls, it is at once quickly cooled in a nitrogen atmosphere. Waste beyond the pinch lines is removed. By means of quick heating and quick cooling, excessive precipitation in the steel of detrimental carbides is avoided and the strength of the steel preserved. The plating shields the steel core against the inherently instantaneous oxidation of the steel surface to chromium oxide when exposed to air and substitutes the more slowly oxidizing surface of the copper or precious metal for effective solid-phase bonding under pressure. The resulting cupronickel or titanium surface of the resulting clad strand is corrosion resistant and in the case of the cupronickel is antifouling because of the cupric ions provided thereby when used for making submarine cables or the like.

3,580,707
PROCESS FOR PREPARING OVERBASED BARIUM SULFONATES, PRODUCTS THEREFROM AND USE IN DISTILLATE FUEL OILS
Warren L. Perilstein, Orchard Lake, Mich., assignor to Ethyl Corporation, New York, N.Y.
No Drawing. Filed July 30, 1969, Ser. No. 846,229
Int. Cl. C10l *1/24, 1/32*
U.S. Cl. 44—51 **20 Claims**

A process for preparing overbased barium olefin sulfonates featuring the use of (1) barium sulfide treated with acetic acid, (2) olefin sulfonic acids, and (3) sulfur dioxide; a product obtained from this process and the use of these products in distillate fuels are described.

3,580,708
METHOD OF FORMING CUTTING TOOL MATERIALS CONSISTING OF ALUMINA AND TITANIUM CARBIDE
Kazuki Ogawa, Fukuoka-shi, and Michito Miyahara, Fukuoka-ken, Japan, assignors to Nippon Tungsten Company, Ltd., Fukuoka-shi, Japan
No Drawing. Filed Mar. 6, 1969, Ser. No. 805,024
Int. Cl. B24d *3/02;* **C04b** *31/16*
U.S. Cl. 51—307 **1 Claim**

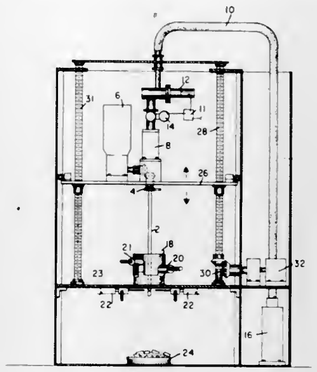
A method of preparing cutting tool materials comprising mixing alumina and titanium carbide particles having an average grain size of less than 3 microns placing said mixture in a graphite mold and hot pressing at a temperature between 1500–1800° C. and a pressure between 150-400 kg./sq. cm. for a period of time up to 40 minutes.

3,580,709
GLASS TREATMENT WITH DISCRETE AREAS
Peter Baldwin Banks, Essex, England, assignor to English Electric Valve Company Limited, London, England
No Drawing. Filed Sept. 7, 1967, Ser. No. 665,995
Claims priority, application Great Britain, Sept. 14, 1966, 41,116/66
Int. Cl. C03c *15/00;* **C03b** *29/00*
U.S. Cl. 65—30 **7 Claims**

In the production of a glass target of an image orthicon a target of Elcon glass is first prepared in oxidising conditions. A thin layer of metal is then deposited through a fine mesh onto one side of the target to produce a mosaic of separated discrete area deposits. The target is finally differentially heated from the side remote from that on which the metal was deposited to raise the temperature of the glass at the discrete areas to about the softening point to render it conductive at those areas without changing the conductivity at the boundaries of the areas.

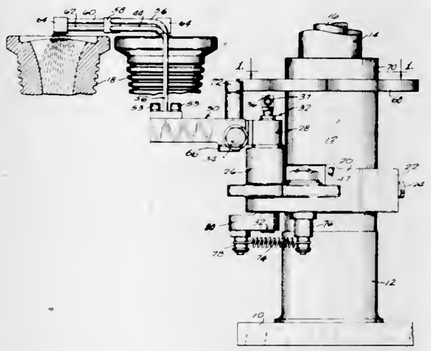
3,580,710
PARTICLE TUBE FUSION FURNACE
Richard G. Britt, Burlington, and Frederick A. Loughridge, Manchester, Mass., assignors to Sylvania Electric Products Inc.
Filed Nov. 15, 1968, Ser. No. 776,208
Int. Cl. C03b *3/00, 19/06*
U.S. Cl. 65—144 **5 Claims**

Equipment for the manufacture of quartz bodies which are free of air pockets including a vacuum system associated with a holder for quartz tubing. The end of quartz tubing is disposed within a furnace for softening. When



soft, the quartz is cut off and a body of air-free quartz is formed.

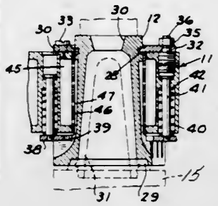
3,580,711
SPRAYING MECHANISM FOR GLASSWARE FORMING MACHINES
Joseph R. Hamilton, Anderson, Ind., assignor to Lynch Corporation, Anderson, Ind.
Filed Aug. 5, 1968, Ser. No. 750,133
Int. Cl. C03b *39/00*
U.S. Cl. 65—169 **12 Claims**



Spraying mechanism for solid parison blanks wherein spray nozzles are mounted on an arm so that they can be located over parison blanks during the spraying operation and swung to a remote location therefrom during the parison pressing operation. Cam and roller means are provided for swinging the arm, and the arm is of dual character so that damage to the arm during certain operations is eliminated by reason of a secondary part of the arm being swingable upwardly out of the way if struck by an obstruction.

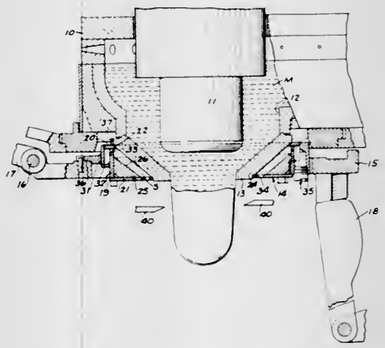
3,580,712
GLASS FORMING MOLD ELEMENTS WITH YIELDING SUPPORTS
Eustace H. Mumford, Ottawa Lake, Mich., assignor to Owens-Illinois, Inc.
Filed Feb. 10, 1969, Ser. No. 797,974
Int. Cl. C03b *9/00, 9/40, 11/00*
U.S. Cl. 65—307 **11 Claims**

A glass forming machine wherein a plurality of charges of glass are delivered to a plurality of parison or blank mold cavities and are formed into parisons after which the parisons are inverted and delivered to a blow mold at another station for forming the final article.



Means are provided for yielding by supporting and cooling each parison or blank mold.

3,580,713
APPARATUS FOR FEEDING GLASS
Helmut T. Schirm, Toledo, and Robert O. Zeigler, Holland, Ohio, assignors to Owens-Illinois, Inc.
Filed Nov. 29, 1968, Ser. No. 779,705
Int. Cl. C03b *7/00*
U.S. Cl. 65—327 **18 Claims**

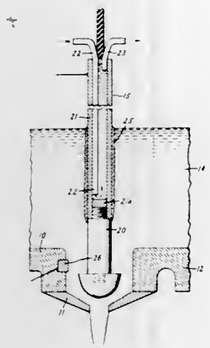


An apparatus for feeding glass comprising a forehearth having an orifice. A refractory orifice ring is supported beneath the orifice by a holder assembly which in turn is supported by a ring support. The holder assembly includes a burner which directs flames against the outer periphery of the orifice ring.

3,580,714
DISCHARGE CONTROL ELEMENT FOR GLASS-MELTING FURNACES
John R. Lucek, Pittsfield, Mass., assignor to General Electric Company
Filed Oct. 30, 1968, Ser. No. 771,853
Int. Cl. C03b *5/32*
U.S. Cl. 65—330 **4 Claims**

The application discloses a discharge control element, such as a needle or plunger, for use in glass-melting furnaces. Such control elements, being movable or adjustable in operation, are adapted to be only partially immersed in molten glass with the immersed tip positioned adjacent a discharge orifice for control of stream-feeding or gob-feeding of the molten glass to utilization equipment. The tip of the rod is formed of a material substantially impervious to erosion in molten glass, and the shank portion of the rod is formed of a metal subject to rapid erosion in molten glass but resistant to oxidation in air. The shank portion is cooled to coat its immersed part with solid glass to protect it against erosion by the molten glass. As disclosed, a preferred form of discharge control element com-

prises a rod having a tubular shank portion of steel provided with passages for the circulation of cooling water,



and a removable immersed tip or head portion formed of molybdenum.

3,580,715
COATED FERTILIZER
Joseph T. Dilday, North Little Rock, Ark., assignor to Olin Corporation
No Drawing. Filed Apr. 16, 1969, Ser. No. 816,808
Int. Cl. C05c *9/00*
U.S. Cl. 71—28 **7 Claims**

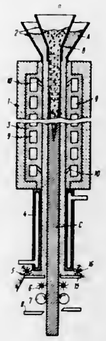
Tenacious coatings of fertilizer supplements are applied to granular high analysis fertilizers, by adding, in order, minor amounts of mineral oil and of aqueous calcium lignosulfonate and then substantial amounts of fertilizer supplements, maintaining the granules in motion during and after each addition until the added material uniformly coats the granules.

3,580,716
METHOD FOR PLANT GROWTH REGULATION
Dorsey R. Mussell, Clare, and Richard A. Schwartzbeck, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Apr. 10, 1968, Ser. No. 720,393
Int. Cl. A01n *5/00, 9/20*
U.S. Cl. 71—76 **4 Claims**

Disclosed is a method involving the exposure of plants and plant parts to a growth regulating amount of tetraisopentylammonium bromide or tetraisopentylammonium chloride, or compositions thereof. Such practice is particularly useful for the regulation of the growth pattern of plant life, particularly as evidenced by the retardation of growth and enhancement of maturation.

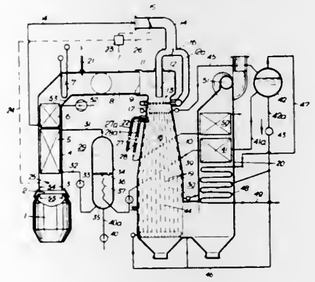
3,580,717
METHOD OF OBTAINING A SPONGY METAL INGOT IN A SHAFT FURNACE
Mikhail Ivanovich Kononov, Svobodny prospekt 9, korpus 2, kv. 55; Evgeny Anatolievich Krasheninnikov, Ulitsa A. Sviridova 1, kv. 7; Vladimir Fedorovich Knyazev, Nikitinskaya ulitsa 5, kv. 53; Evgeny Nikolaevich Vasiliev, Ulitsa Barklaya 5, korpus 1, kv. 54; Petr Yakovlevich Nasonov, 5 Parkovaya ulitsa 26, kv. 89; and Evgeny Petrovich Timofeev, Golynaovo 18, kv. 89, all of Moscow, U.S.S.R.
Filed Sept. 22, 1967, Ser. No. 669,815
Int. Cl. C21b *13/02;* **C22b** *5/02*
U.S. Cl. 75—37 **3 Claims**

A method of obtaining a spongy metal comprises reducing metal-containing oxides with a solid reducing agent in an externally heated shaft furnace by charging the furnace with separate flows of the metal-containing oxides and a solid reducing agent, the metal-containing oxides and reducing agent flowing coaxially with the reducing agent surrounding the metal-containing oxides. Heating the oxides and reducing agent to result in reduc-



tion of the oxides and sintering of the metal thereby produced into a sponge metal ingot. The metal ingot passes from the furnace through an opening in a receiving table while the reducing agent is removed from the table.

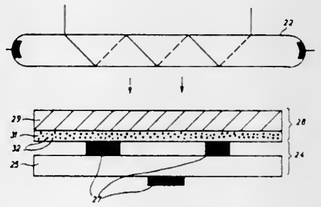
3,580,718
METHOD FOR THE UTILIZATION OF HOT WASTE GASES FROM FURNACES OF METALLURGICAL WORKS
Heinrich Rasworschegg, Demeter Markow, and Alfred Sandri, Graz, Austria, assignors to Waagner-Biro Aktiengesellschaft, Vienna, Austria
Filed Dec. 6, 1967, Ser. No. 688,593
Int. Cl. F22b *1/18*
U.S. Cl. 75—60 **11 Claims**



A method of utilization of combustible hot waste gases from furnaces of metallurgical works, in particular from steel converters, in an installation for the utilization of waste heat, comprising the steps of first cooling the hot combustible waste gases for removing at least partially the enthalpy of the gases by passing them in indirect heat exchange relationship with water and air, burning the so cooled waste gases in a combustion chamber with the preheated air and without intermediate storing of the waste gases flowing the products of combustion so produced through the combustion chamber and feeding the preheated water to the combustion chamber and flowing it therethrough in indirect heat exchange relationship with the products of combustion to generate steam, whereby both the enthalpy of the waste gases and the heat of

combustion thereof are utilized in the generation of the steam, adding reaction heat liberated during the burning of the cooled waste gases in the combustion chamber with an additional medium during the cooling step; and the step of burning the cooled waste gases in a combustion chamber with the preheated air is performed in response to the speed of decarburization in the furnace.

3,580,719
THERMOGRAPHIC RECORDING PROCESS
Eric Maria Brinckman, Mortsel-Antwerp, Belgium, assignor to Gevaert-Agfa N.V., Mortsel, Belgium
Continuation of application Ser. No. 560,128, June 24, 1966. This application Aug. 4, 1969, Ser. No. 849,582
Int. Cl. G03c *5/04*
U.S. Cl. 96—27 **10 Claims**



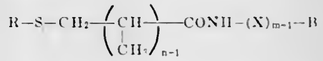
Information is reproduced by the steps of exposing to a mainly visible light image a recording layer containing at least about 80% by weight of a normally water-soluble polymer of certain selected types which is substantially insensitive to visible light but when heated undergoes a loss in its normal solubility in aqueous solvents and contacting the exposed recording layer with an aqueous solvent for the purpose of removing the unexposed soluble areas thereof thereby leaving a relief image corresponding to the original. The recording layer contains uniformly distributed therethrough a finely divided substance that absorbs and converts visible radiation into heat, the amount of such substance being sufficient to impart to the recording layer an optical density of about 0.2–1 in the event reflex exposure is practiced or of at least about 0.2 in the event the exposure is direct. The recording layer is substantially transparent except for the radiation absorbing and converting substance. The time of the exposure does not exceed 10^{-2} seconds, and the intensity of the radiation is sufficiently large as to generate within that time by virtue of the absorption and conversion effect of the substance sufficient heat to produce a loss in solubility in the polymer in the exposed area.

3,580,720
PHOTOGRAPHIC SENSITIZED PAPERS EXCELLENT IN FLUORESCENT BRIGHTENING EFFECT AND PROCESS FOR PREPARING THE SAME
Yasushi Ohyama, Takatsuki-shi, and Sadayuki Miyazawa, Otokuni-gun, Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan
No Drawing. Filed Mar. 26, 1969, Ser. No. 810,795
Claims priority, application Japan, Mar. 30, 1968, 43/20,412
Int. Cl. G03c *1/92, 1/84, 1/08*
U.S. Cl. 96—82 **4 Claims**

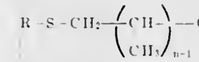
A photographic sensitized paper can be greatly enhanced in fluorescent brightening effect by incorporating into a binder in the photographic layer a starch derivative having in combination an aminoguanidine group and an aldehyde group. This starch derivative is a mordant which makes the binder completely non-diffusible to a fluorescent dye.

3,580,721
LIGHT-SENSITIVE COLOR-PHOTOGRAPHIC MATERIAL
Masakuni Iwama, Isaburo Inoue, and Teruo Hanzawa, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
No Drawing. Filed Oct. 22, 1968, Ser. No. 769,707
Claims priority, application Japan, Oct. 23, 1967, 42/67,820
Int. Cl. G03c *1/40*
U.S. Cl. 96—100 **8 Claims**

Couplers for inclusion into the silver halide emulsion layer of a color-photographic material; said coupler having the formula:



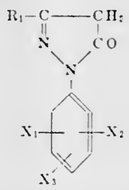
wherein R is an aliphatic hydrocarbon residue having 8–18 carbon atoms; B is a coupler residue; X is a group bonding B to



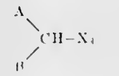
and m and n are 1 or 2.

3,580,722
LIGHT-SENSITIVE SILVER HALIDE COLOR PHOTOGRAPHIC EMULSION
Kenro Sakamoto, Takao Takahashi, Takeo Koitabashi, and Mitsuto Fujiwara, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
No Drawing. Filed Feb. 6, 1969, Ser. No. 797,277
Claims priority, application Japan, Feb. 9, 1968, 43/7,748
Int. Cl. G03c *1/40*
U.S. Cl. 96—100 **6 Claims**

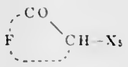
A color photographic emulsion containing a color former of the formula:



and at least one compound of the formula:

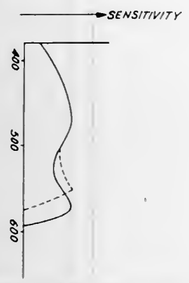


or



wherein R_1 is alkyl, acylamino or sulfonamido; X_1, X_2 and X_3 are hydrogen, alkyl, halogen, acylamino, alkylcarbamoyl, sulfonamido, sulfamoyl, alkoxy or aryloxy; A and B are $-COR_2$, $-COOR_2'$, $-CONHR_2''$ or $-CN$; R_2, R_2', R_2'', X_4 and X_5 are allyl, alkyl, aryl, cycloalkyl or araklyl and F is an atom or radical necessary to form a pyrazolone ring.

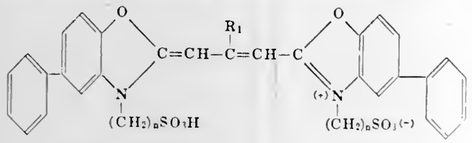
3,580,723
LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC EMULSION
Shui Sato and Kaiichiro Sakazume, Tokyo, and Eiichi Sakamoto, Hanno-shi, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan
Filed Dec. 12, 1968, Ser. No. 783,222
Int. Cl. G03c *1/28*
U.S. Cl. 96—122 **12 Claims**



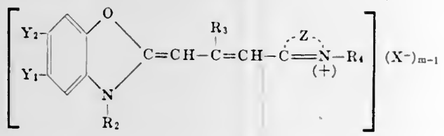
Light sensitive silver halide photographic emulsions are supersensitized by coating with a supersensitizer constituted by a combination of two different oxacarbocyanine dyes.

3,580,724
LIGHT-SENSITIVE SUPERSENSITIZED SILVER HALIDE COLOR PHOTOGRAPHIC EMULSIONS
Shui Sato, Kaiichiro Sakazume, and Tateshi Iytaka, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd.
No Drawing. Filed May 28, 1969, Ser. No. 828,750
Claims priority, application Japan, June 4, 1968, 43/37,740
Int. Cl. G03c *1/28*
U.S. Cl. 96—124 **5 Claims**

A supersensitized silver halide emulsion containing in combination a sensitizing dye of the formula



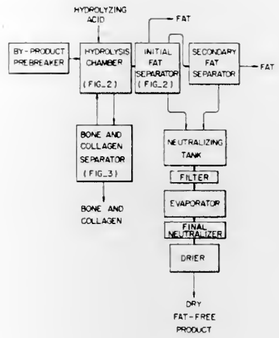
and a sensitizing dye of the formula



wherein the various symbols are described in the claims.

3,580,725
PROCESS FOR SEPARATING AND RECOVERING BONE AND COLLAGEN FROM ANIMAL BY-PRODUCTS
William Kuster, 1211 Avondale Road, Hillsborough, Calif. 94010
Filed Apr. 3, 1968, Ser. No. 718,629
Int. Cl. A23k *1/10*
U.S. Cl. 99—7 **4 Claims**

Method for separating bone (and collagen) from partially hydrolyzed animal tissue by employing an aqueous hydrolyzing solution wherein, because of the specific gravity differential between the bone (and collagen) and the fleshy tissue, the fleshy tissue will at least temporarily float in the solution while the bone (and collagen) will sink. As a result, the bone (and collagen) are separated from the fleshy tissue by passing the solution along an



elongated path where the bone (and collagen) settle out of the solution.

3,580,726
METHOD OF INCREASING SOLUBILITY OF FOOD ACIDULENTS
Charles Dame, Jr., Wheaton, Ill., assignor to General Foods Corporation, White Plains, N.Y.
No Drawing. Continuation-in-part of application Ser. No. 694,417, Dec. 29, 1967, which is a continuation-in-part of application Ser. No. 370,356, May 26, 1964. This application Nov. 24, 1969, Ser. No. 879,623
Int. Cl. A23l *1/00;* **B01j** *1/00*
U.S. Cl. 99—78 **4 Claims**

Ground fumaric or adipic acid is impregnated with an aqueous solution of propylene gylcol, agglomerated, and dried. The dried agglomerates are then subdivided to provide an acid of increased solubility.

3,580,727
PROCESS FOR MAKING EXPANDED SNACK PRODUCT
Clayton O. Gulstad, Coon Rapids, Minn., assignor to General Mills, Inc.
No Drawing. Filed Aug. 28, 1967, Ser. No. 663,503
Int. Cl. A23l *1/10*
U.S. Cl. 99—81 **11 Claims**

A new food product and process for making it by explosively puffing grain kernels which have been tempered with a hull modifying and flavoring agent, milling the puffed grain into flour or meal, mixing the flour with water to make a dough which is formed into chips, and subjecting the chips to intense heat.

3,580,728
PROCESS FOR MAKING EXPANDED SNACK PRODUCT
Clayton O. Gulstad, Coon Rapids, and Francis J. Eastburn, Minneapolis, Minn., assignors to General Mills, Inc.
No Drawing. Filed Aug. 28, 1967, Ser. No. 663,501
Int. Cl. A23l *1/10*
U.S. Cl. 99—81 **13 Claims**

A new food product and process for forming it. A flour is formed by explosively puffing a cereal grain and milling the puffed grain to form a pulverulent material. A dough, formed by combining the flour with water and one or more flavoring ingredients, is then formed into pieces which are subjected to intense heat to produce the final product.

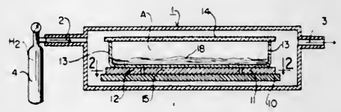
3,580,729
PROTEIN-SUPPLEMENTED PEANUT SPREAD
Richard T. Darragh and John A. Succo, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Feb. 4, 1969, Ser. No. 796,584
Int. Cl. H23l *1/38*
U.S. Cl. 99—128 **7 Claims**

A peanut spread supplemented with soybean protein and having a peanut butter-like eating quality, color and flavor is prepared by admixing particular amounts of soy flour and liquid vegetable oil with conventional peanut butter ingredients, heat treating the resulting combination by maintaining it at a temperature ranging from about 300° F. to about 500° F. for from about 1 to about 5 minutes, and chilling the heat-treated mixture to a temperature ranging from about 35° to about 85° F., for example in a scraped wall heat exchanger.

3,580,730
DISCONTINUOUS POLYCARBONATE COATINGS
Thomas S. Grabowski, Vienna, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.
No Drawing. Filed June 12, 1968, Ser. No. 736,254
Int. Cl. B44d *1/44*
U.S. Cl. 117—8 **1 Claim**

A method of providing a discontinuous polycarbonate coating on a thermoplastic substrate comprising the steps of dissolving a polycarbonate resin in a polycarbonate solvent, applying the resulting solution to a thermoplastic substrate, evaporating the solvent to form a continuous polycarbonate coating, and subsequently treating the coating with a developing solvent to form a discontinuous coating.

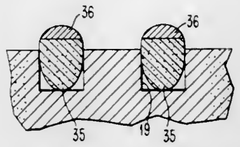
3,580,731
METHOD OF TREATING THE SURFACE OF A FILAMENT
John V. Milewski, Saddle Brook, and James J. Shyne, Caldwell, N.J., assignors to General Technologies Corporation
Filed Sept. 26, 1967, Ser. No. 670,628
Int. Cl. C01b *31/30;* **C23c** *11/08*
U.S. Cl. 117—66 **14 Claims**



The method of increasing the interlaminar shear strength capabilities of a material to be bonded to another material by growing integrally-attached monocrystalline whiskers out from the surface of the first material both to roughen its surface for bonding to a deposited matrix material, or to a plastic, and to change its surface chemistry to improve bonding, for instance to a resin. The invention includes the reinforcing of fiberous structures by the intertwining of whiskers grown across voids therebetween, and further includes various whisker-grown structures per se.

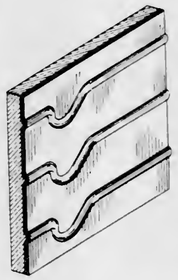
3,580,732
METHOD OF GROWING SINGLE CRYSTALS
A Eugene Blakeslee, Mount Kisco, Thomas F. Gukelberger, Jr., Hopewell Junction, and Vincent J. Lyons, Poughkeepsie, N.Y., asssignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 15, 1968, Ser. No. 697,770
Int. Cl. B44d *1/02*
U.S. Cl. 117—106 **19 Claims**

A method for selectively growing single crystal islands in a dielectric substrate and the resulting structure. The substrate has recesses formed in its surface to receive bodies therein. By applying a temperature gradient across each of the bodies throughout the entire heating cycle, nucleation occurs only at a bottom point on each of the



bodies when a vapor containing the material to be nucleated is passed over the bodies with the material of the bodies being molten.

3,580,733
FOOD COOKING APPARATUS HAVING CONTINUOUS CLEANING PROPERTIES AND PROCESS FOR PRODUCING SAME
Robert E. Ott, Bel Air, Md., assignor to SCM Corporation, Cleveland, Ohio
Filed Apr. 17, 1969, Ser. No. 817,128
Int. Cl. C23d *5/00*
U.S. Cl. 117—129 **11 Claims**



An improvement in the process for producing an adherent ceramic coating on a metal substrate used in food cooking apparatus, the coating having the continuous cleaning property of diminishing accumulation of carbonaceous residue which results from the exposure to grease spatters at ordinary operating temperatures, can be effected by: applying to the substrate in intimate contact with each other an enameling composition comprising alkali-bearing glass frit particles, about ½ to 25% halide basis weight of said glass frit, and about 2–75 parts, per 100 parts of solids in said enameling composition, of particulate elemental metal selected from the group consisting of aluminum, magnesium, high alloys of either, and mixtures of the same; heating the resulting deposit in a heating zone until it forms, by interaction of the frit and the particulate metal, an integral, porous, sorptive surface structure containing crystalline devitrification products; then arresting said interaction in a cooling zone before substantial coalescence of the structure occurs. Cooking oven walls, fixed or removable panels, broiler pans and racks incorporating the resulting coated metal substrates can be made.

3,580,734
ANTISTATIC FILM BASE MATERIAL AND PROCESS FOR PREPARING SAME
Margaret L. Clachan, Patrick T. McGrail, and Basil R. Shephard, Brantham, Manningtree, England, assignors to Bexford Limited, Manningtree, England
No Drawing. Filed Sept. 21, 1967, Ser. No. 669,384
Claims priority, application Great Britain, Sept. 30, 1966, 43,843/66
Int. Cl. B32b *27/06;* **C09k** *3/16*
U.S. Cl. 117—138.8 **6 Claims**

This application describes a process of rendering film base less prone to pick up static electricity which com-

prises coating the film base with a layer consisting essentially of a sodium, potassium or lithium salt of a copolymer of an alpha-beta unsaturated dicarboxylic acid or anhydride with an ethylenically unsaturated comonomer.

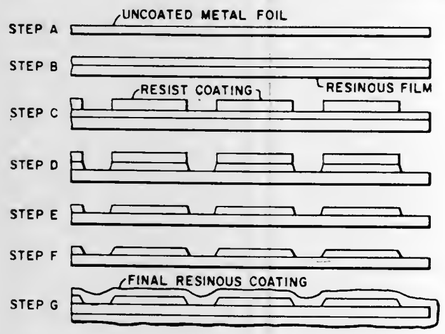
3,580,735
POLYOLEFIN-MOLDED ARTICLE HAVING GOOD ANTISTATIC PROPERTY AND PREPARATION OF THE SAME
Yutaka Shimodoi, Suita-shi, Heiichiro Ootake, Kouichi Mihara, and Kiyoshi Takao, Ibaragi-shi, and Shogo Matsuda, Tokyo, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan
No Drawing. Filed Dec. 30, 1968, Ser. No. 788,005
Claims priority, application Japan, Dec. 30, 1967, 43/84,662, 43/84,663
Int. Cl. B44d *1/22*
U.S. Cl. 117—138.8E **6 Claims**

In a polyolefin fiber, containing therein an internal antistatic agent such as quarternary ammonium salts, glycerides or higher fatty acid amides and a modifying agent selected from aluminum oxide, calcium chloride, calcium carbonate, diphenyl phthalate, tricresyl phosphate and polyethylene glycol, an improved article having more durable antistatic effect by coating the outer layer of the article with an external antistatic agent such as relatively high molecular vinyl polymer.

3,580,736
PAPERBOARD IMPREGNATED WITH A PETROLEUM WAX-POLYURETHANE BLEND
Hallard C. Moyer, Homewood, Ill., and Eugene M. Fauber, Hammond, Ind., assignors to Atlantic Richfield Company, New York, N.Y.
No Drawing. Filed Apr. 26, 1967, Ser. No. 633,717
Int. Cl. C08g *51/52;* **D21h** *1/40*
U.S. Cl. 117—155 **7 Claims**

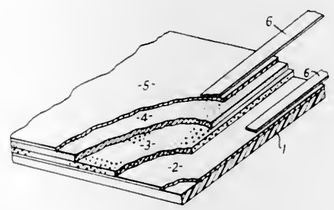
Paperboard is impregnated with a composition containing a major amount of petroleum wax and a minor amount of a wax-compatible urethane which is prepared from an excess of a hydrocarbon diisocyanate and a hydroxy-terminated diene polymer. The preferred diisocyanate is tolylene diisocyanate and the preferred polybutadiene has at least two average terminal hydroxyl groups in the allylic position. Impregnation of paperboard with the composition provides a product having significantly improved strength, rigidity and water resistance.

3,580,737
CHEMICAL RADIUSING CONDUCTOR EDGES OF FLAT CABLE
Edward J. Traynor, Jr., Stoughton, Mass., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Jan. 18, 1968, Ser. No. 698,968
Int. Cl. C23b *1/02;* **B44d** *1/18*
U.S. Cl. 117—212 **10 Claims**



A metal foil is coated on one side with a resinous film. An etch resist coating is deposited on the metallic foil in a predetermined pattern to produce a desired configuration of metal conductor strips after the composite is passed first through a metal etching solution and then a solution which removes the resist coating. The resulting flat metallic conductors have sharp undercut etched edges. The composite is again passed through a metal etching solution. The sharp conductor edges are thereby rounded so that the metallic conductors are reduced to a cross section without sharp edges. The exposed conductors are coated with a resinous film to complete the insulation of the conductors. The rounded edges of the conductors permit the cable to be creased without cracking the insulation.

3,580,738
PLASTICS MATERIALS WITH CONDUCTIVE SURFACES
Peter Whitten Ranby and John Lenard Northwood, London, England, assignors to Thorn Electrical Industries Limited, London, England
Continuation of abandoned application Ser. No. 511,428, Dec. 3, 1965. This application Feb. 16, 1970, Ser. No. 10,094
Claims priority, application England, Dec. 4, 1964, 49,510/64
Int. Cl. B44d *1/14, 1/18*
U.S. Cl. 117—215 **4 Claims**



A method of making light transmitting plastics electrically conductive including depositing a layer of indium metal upon the plastic, heating the layer and then washing it with an acid.

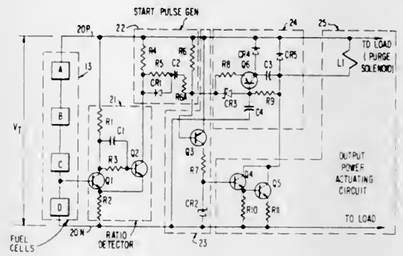
3,580,739
GRID ELECTRODE FOR ELECTRONIC TUBES
Gunter Ciriack, Berlin, and Georg Eckert and Horst Hofmann, Munich, Germany, assignors to Siemens Aktiengesellschaft
No Drawing. Filed Jan. 2, 1968, Ser. No. 694,804
Claims priority, application Germany, Jan. 4, 1967, S 107,728
Int. Cl. H01j *19/38;* **C23b** *5/50*
U.S. Cl. 117—217 **10 Claims**

The invention is directed to electronic tubes wherein a grid electrode is constructed of any alloy containing a zirconium oxide which may be added either to the base metal forming the grid wires in amounts of 0.1 to 2% by weight or to a coating of zirconium in amounts of 10 to 50% by weight which covers the base metal.

3,580,740
ZINC ELECTRODE CONTAINING LEAD SULFIDE TO REDUCE GASSING AT THE ZINC ELECTRODE IN HEAT STERILIZED SILVER ZINC ALKALINE BATTERY
Herbert I. James, Levittown, Pa., assignor to ESB Incorporated
No Drawing. Filed Sept. 4, 1968, Ser. No. 758,653
Int. Cl. H01m *41/00*
U.S. Cl. 136—30 **6 Claims**

A zinc electrode containing a lead sulfide additive to reduce gassing at the zinc electrode which is used as the negative electrode in a heat sterilized silver-zinc alkaline battery. The lead sulfide effectively reduces gassing at the zinc electrode without adversely affecting the capacity of the heat sterilized battery, whereas the conventional mercuric oxide additive reduces the capacity of the heat sterilized battery. The lead sulfide additive may be used in amounts ranging from about 1 to about 10% by weight of the active material additive mixture.

3,580,741
UNIVERSAL AUTOMATIC SENSING AND ACTUATING CONTROL SYSTEM FOR FLUID CONSUMING POWER SOURCES AND THE LIKE
Thomas C. Hovious, Peabody, and Robert A. Torkildsen, Danvers, Mass., assignors to General Electric Company
Filed July 29, 1968, Ser. No. 748,469
Int. Cl. H01m *27/12*
U.S. Cl. 136—86 **8 Claims**



A combined sensing and output power actuating control system for electrically operable devices such as electric power generation assemblies of the fluid consuming battery type, such as fuel batteries. The control system is comprised by a ratio detector circuit which is coupled, for example, across the output terminals of a fuel battery and also coupled across the last fuel cell unit in the fuel battery for comparing the ratio of the proportional voltage appearing across the last fuel cell to the output terminal voltage of the fuel battery to a preset value and deriving an output trigger signal in response to the ratio varying from the preset value. Timing circuit means are coupled to the output of the ratio detector circuit and are responsive to the output trigger signal from the ratio detector. An output power actuating circuit which is comprised by a purge valve actuator is energized for a predetermined time period by the timing circuit in response to the output from the ratio detector for purging the fuel battery of undesired accumulated inert gaseous matter thereby restoring the fuel battery to full operating capacity.

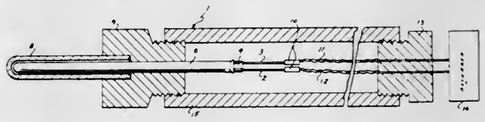
3,580,742
SEPARATOR-ELECTROLYTE CARRIER FOR PRIMARY CELLS
Viktor Arsenievich Naumenko, Novoslobodskaya ul. 62, kv. 64; Tatiana Nikolaevna Toroptseva, 3 Mytischinskaya ul. 14-a, kv. 109; Lidia Fedorovna Penkova, 3 Mytischinskaya ul. 14-a, kv. 124; Andrei Akimovich Vyselkov, Murmansky proezd 6, kv. 27; and Galina Ivanovna Rogova, Prospekt Mira 169, kv. 12, all of Moscow, U.S.S.R.
No Drawing. Filed Jan. 11, 1968, Ser. No. 697,001
Int. Cl. H01m *11/00*
U.S. Cl. 136—155 **3 Claims**

A separator-electrolyte carrier for wet primary cells activated by water or electrolyte solutions, made of a cellulosic material impregnated by an aqueous solution, ensuring a rapid activation of the cells and increasing their service life; said separator can be used in all cases where the above properties are of importance, for instance, in cells for rescue operations.

3,580,743
THERMOELECTRIC MODULE WITH DIAGONAL CONSTRUCTION AND METHOD OF MANUFACTURING
Colin A. A. MacPhee, Beaurepaire, and Antonio C. P. Haene, Laval des Rapides, Quebec, Canada, assignors to Borg Warner Corporation, Chicago, Ill.
Filed Jan. 7, 1966, Ser. No. 519,363
Int. Cl. H01v *1/30*
U.S. Cl. 136—212 **31 Claims**

A thermoelectric module construction comprising a first row of blocks made of semi-conductive P-type material and a second row of blocks made of semi-conductive N-type material parallel to the first row, with the blocks in the first row located directly opposite those in the second row. One end of each block in the first row is joined by a conductor to a corresponding end of a block directly opposite in the second row. An opposite end of each block in the first row is joined by a conductor to a corresponding opposite end of a block diagonally opposite in the second row.

3,580,744
IMMERSION THERMOCOUPLE FOR ATMOSPHERIC AND VACUUM ENVIRONMENTS
Shingo Inouye, Kettering, and George Saul, Dayton, Ohio, assignors to the United States of America as represented by the Secretary of the United States Air Force
Filed Feb. 4, 1969, Ser. No. 796,356
Int. Cl. H01v *1/02*
U.S. Cl. 136—234 **3 Claims**



A thermocouple assembly including a protection tube made of a tantalum alloy. The protection tube is of a length sufficient to encompass the thermocouple wires and is concentrically positioned inside of an outer tube made of quartz. Thus, the protection tube acts as a barrier and shields the thermocouple wires from the highly corrosive gases caused by metals acting on the quartz outer tube.

3,580,745
SEMICONDUCTOR DEVICE
Else Kooi and Aant Bouwe Daniel van der Meer, Emmasingel Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed May 27, 1966, Ser. No. 553,409
Claims priority, application Netherlands, June 5, 1965, 6507231
Int. Cl. H01l *7/34, 7/54*
U.S. Cl. 148—1.5 **5 Claims**

A method of making different circuit elements integrated in a common semiconductive wafer by modifying the properties and composition of the oxide portions which cover the surface of the wafer over the elements. Various methods are described for obtaining different oxide properties, for example, providing a layer of silicon

monoxide over the usual silicon dioxide, or subjecting selected oxide coating portions to X-radiation or ultraviolet radiation.

3,580,746
PROCESS FOR THE MODIFICATION OF THE MECHANICAL CHARACTERISTICS OF CARBON STEEL WIRE
Isaac Behar, Bourg-en-Bresse, France, assignor to Trefileries & Cableries de Bourg et du Havre, Bourg-en-Bresse, Ain, France
Filed Sept. 29, 1967, Ser. No. 671,720
Claims priority, application France, Oct. 4, 1966, 78,740, 78,741
Int. Cl. C21d *9/52*
U.S. Cl. 148—12 **8 Claims**

The invention deals with a process for the modification of the mechanical characteristics of carbon steel wire, consisting of the following first patenting, then cold deforming, and finally deforming said wire at a temperature above the ambient temperature but below the recrystallization temperature of the steel in said wire, by applying transverse force to said wire.

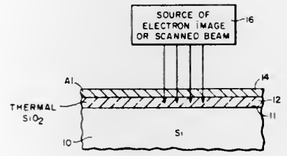
3,580,747
PRODUCTION OF ALUMINUM ZINC MAGNESIUM ALLOY ARTICLES
Fred Howitt, Collins Bay, Ontario, and Ian Taylor, Kingston, Ontario, Canada, assignors to Aluminium Laboratories Limited, Montreal, Quebec, Canada
No Drawing. Filed Nov. 17, 1967, Ser. No. 683,782
Int. Cl. C22f *1/04*
U.S. Cl. 148—12.7 **13 Claims**

In procedure for producing a solution heat treated aluminum-zinc-magnesium alloy article which is subjected to substantial cold working after solution heat treatment, but is nevertheless characterized by superior resistance to stress corrosion, the successive steps of heating the article to a solution-heat-treating temperature; cooling the article, at a rate maintained between 0.1° C./second and 20° C./second at least during cooling of the article from 350° C. to 250° C.; and subjecting the article to more than 5% cold working. Preferably, the alloy contains 0.20–0.7% manganese and 0.10–0.25% zirconium. A specific preferred alloy composition consists essentially of 3.8–4.6% zinc; 1.0–2.0% magnesium; 0.20–0.7% manganese; 0.10–0.25% zirconium; not more than 0.4% iron; not more than 0.25% silicon; other elements, not more than 0.03% each and not more than 0.10% total; balance aluminum.

3,580,748
WELDING FLUX COMPONENT
William T. Delong, Manchester Township, York County, Pa., assignor to The McKay Company, Pittsburgh, Pa.
No Drawing. Filed July 12, 1968, Ser. No. 744,317
Int. Cl. B23k *35/36*
U.S. Cl. 148—26 **24 Claims**

A welding flux component comprising a fused mixture consisting essentially of the following listed constituents in the specified weight percentages: about 40% to about 90% of at least one stabilizing compound selected from the group consisting of fluorides, silicofluorides and fluoaluminates and about 10% to 60% of basic oxide. The flux component may also contain acidic oxide and neutral oxide, the fused mixture having a base-to-acid mole ratio of at least 2 to 1. Preferred stabilizing compounds include manganese fluoride, aluminum fluoride, potassium silicofluoride, sodium silicofluoride, lithium silicofluoride, potassium fluoaluminate, sodium fluoaluminate and lithium fluoaluminate. Preferred welding flux components have a base-to-acid mole ratio of at least 3 to 1.

3,580,749
METHOD AND APPARATUS FOR SELECTIVE ETCHING OF INSULATING LAYERS
Alan J. Simon, Trafford, and Joseph E. Johnson and Terence W. O'Keeffe, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Nov. 13, 1968, Ser. No. 775,276
Int. Cl. H01l *7/00, 7/44*
U.S. Cl. 148—187 **11 Claims**



In selective etching by the bombardment enhanced etching rate (BEER) effect, a metal layer on the bombardment insulator is used to provide increased etch enhancement. The metal layer also may serve as an electrode in biasing the structure to produce a beam induced current from which the applied dose is indicated.

3,580,750
TMETN-INORGANIC NITRATE EXPLOSIVES BLENDED WITH PETROLEUM OIL
George L. Griffith, Coopersburg, Pa., assignor to Commercial Solvents Corporation, Terre Haute, Ind.
No Drawing. Filed Oct. 7, 1968, Ser. No. 765,615
Int. Cl. C06b *15/00*
U.S. Cl. 149—38 **18 Claims**

Explosive mixtures are provided, based on trimethylolethane trinitrate and an inorganic nitrate, in which the rate of detonation and, optionally, also sensitivity, are controlled by the use of petroleum oil in formulating the explosive.

3,580,751
TMETN-INORGANIC NITRATE EXPLOSIVES BLENDED WITH HOT INORGANIC NITRATE
George L. Griffith, Coopersburg, Pa., assignor to Commercial Solvents Corporation, Terre Haute, Ind.
No Drawing. Filed Oct. 7, 1968, Ser. No. 765,616
Int. Cl. C06b *19/02*
U.S. Cl. 149—38 **8 Claims**

Explosive mixtures are provided, based on trimethylolethane trinitrate and an inorganic nitrate, having a high rate of detonation and good sensitivity due to the use of hot inorganic nitrate in formulating the explosive.

A process also is provided for preparing such explosive mixtures, by mixing the inorganic nitrate with the trimethylolethane trinitrate at a temperature within the range from about 100° to about 150° F. The mixing can be carried out in the presence of a small amount of water, to facilitate the blending and control rate of detonation, without affecting sensitivity.

3,580,752
TMETN-INORGANIC NITRATE EXPLOSIVES BLENDED WITH WATER
George L. Griffith, Coopersburg, Pa., assignor to Commercial Solvents Corporation, Terre Haute, Ind.
No Drawing. Filed Oct. 7, 1968, Ser. No. 765,656
Int. Cl. C06b *15/00*
U.S. Cl. 149—38 **11 Claims**

Explosive mixtures are provided, based on trimethylolethane trinitrate and an inorganic nitrate, having a controlled rate of detonation and good sensitivity and explo-

sive power, due to the presence of water in an amount of at least 1%.

A process also is provided for controlling the rate of detonation while retaining good sensitivity and explosive power of such explosive mixtures, by mixing the inorganic nitrate with the trimethylolethane trinitrate, optionally at a temperature within the range from about 100° to about 150° F. in the presence of water in an amount in excess of 1%.

3,580,753
TMETN-INORGANIC NITRATE EXPLOSIVES BLENDED WITH ALUMINUM
George L. Griffith, Coopersburg, Pa., assignor to Commercial Solvents Corporation, Terre Haute, Ind.
No Drawing. Filed Oct. 7, 1968, Ser. No. 765,697
Int. Cl. C06b *9/00*
U.S. Cl. 149—39 **17 Claims**

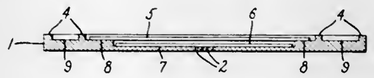
Explosive mixtures are provided, based on trimethylolethane trinitrate and an inorganic nitrate, having a high rate of detonation and good sensitivity due to the incorporation of aluminum particles in the explosive.

A process also is provided for preparing such explosive mixtures, by mixing the inorganic nitrate and particulate aluminum with the trimethylolethane trinitrate.

3,580,754
PROCESS FOR PREPARATION OF PENTOLITE
Philip Barnhard IV, West Chester, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed May 1, 1969, Ser. No. 821,083
Int. Cl. C06b *3/00*
U.S. Cl. 149—93 **7 Claims**

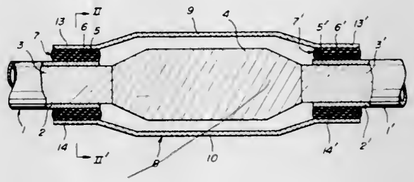
Process for the preparation of stable pentolite from crude pentaerythritol tetranitrate comprising agitating in water a mixture of molten trinitrotoluene and crude pentaerythritol tetranitrate at a temperature above the melting point of the trinitrotoluene and below the melting point of the pentaerythritol tetranitrate, while maintaining the pH of the water in the range from 7 to about 10, followed by separating the pentolite from the aqueous phase.

3,580,755
NONFLAMMABLE, THIN, INTEGRALLY ILLUMINATED CONTROL PANEL OVERLAY
Thomas L. Kidd, Jr., Norristown, and Albert D. McClain, Jr., Philadelphia, Pa., assignors to General Electric Company
Filed Feb. 16, 1968, Ser. No. 706,044
Int. Cl. C23f *17/00;* **B44c** *1/22*
U.S. Cl. 156—3 **2 Claims**



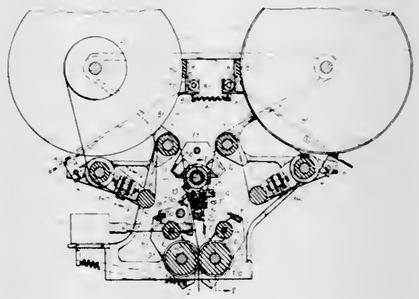
A nonflammable control panel overlay with legible indicia openings, integral illumination and integral supporting means comprises a metallic member with indicia openings on the front thereof backed by a nonflammable, transparent backing member mounted in a recessed area on the back of the member behind the indicia openings, an electroluminescent lamp mounted in a second recessed area behind the transparent backing member and ribs on the back side of the member comprising the unetched areas left when the various mounting recesses are formed. Such a metallic overlay is made by mechanically engraving the indicia, on the front of a metal blank and then chemically etching the rear of the blank, in a stepwise fashion to form the various recesses and remove unnecessary material, until breakthrough to the indicia occurs.

3,580,756
METHOD OF JOINTING SHEATHS OF ALUMINUM SHEATHED CABLES
Toshio Kashara, 1616 Ohmachi-7-chome, Kamakura-shi, Japan, and Mitsuru Numao, 10–101 Kudencho-Donchi, Nihon Jutaku Kodan, 740 Kudencho, Totsuka-ku, Yokohama-shi, Japan
Continuation of application Ser. No. 610,716, Jan. 20, 1967, now Patent No. 3,447,986. This application July 19, 1968, Ser. No. 746,017
Claims priority, application Japan, Jan. 31, 1962, 37/2,841
Int. Cl. H01r *5/00*
U.S. Cl. 156—49 **1 Claim**



Method of jointing sheaths of cables in gas-tight and liquid-tight fashion wherein the end portions of the metal sheaths of the cables to be jointed are wrapped with composite layers of metal tape coated with a cold-setting synthetic resin, the sleeves of a junction box are positioned over the composite layers on each end of the cable, the sleeves are contracted into contact with the composite layers, and a protective layer is formed over the outer periphery of the sleeves and the outer surfaces of the cables over the sheaths.

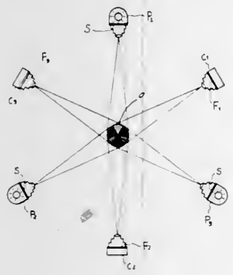
3,580,757
WEB WINDING MACHINES
Otto Niepmann, Gevelsberg, Westphalia, Germany, assignor to Maschinenfabrik Fr. Niepmann & Co., Gevelsberg, Westphalia, Germany
Filed July 17, 1968, Ser. No. 745,660
Claims priority, application Germany, July 18, 1967, M 74,804
Int. Cl. B65h *19/08*
U.S. Cl. 156—504 **6 Claims**



An apparatus for connecting the rear end of a web of a nearly empty unwinding roll to a front end portion of

a web carrying an adhesive strip and pertaining to a new roll to be unwound, which includes two pressing rollers for receiving therebetween the unwinding end of the web from one roller and the forward end of the web of a new roller while a cutter is provided between the web rollers and the pressing rollers for alternate cooperation with the rear end portion of the nearly empty web roll to cut said rear end portion off after it has been pressed and glued to the front portion of the new web, electromagnetic control means controlled by the rear end of the unwinding web being provided for reducing the speed of the respective unwinding web pror to the cutting off operation of said cutter.

3,580,758
METHOD FOR REPRODUCING THREE-DIMENSIONAL IMAGE
Isao Morioka, 3–23 Ookagma 2-chome Meguro-ku, Tokyo, Japan
Filed May 8, 1968, Ser. No. 727,419
Claims priority, application Japan, May 9, 1967, 42/29,325; May 15, 1967, 42/30,706
Int. Cl. B44b *1/00*
U.S. Cl. 156—58 **3 Claims**

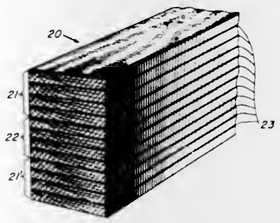


A method for reproducing a three-dimensional image comprising the steps of projecting on an object screens each consisting of a plurality of parallel lines as schematically shown in FIG. 6–*c*, photographing said object O having the shades in the form of curved lines formed thereupon by said projection so as to resolve the surface of said object into a multitude of curved lines, thereafter projecting thus obtained photographs and said screens at the same time upon a body of clay, and applying clay or removing clay from said body in such a manner that said curved lines are concentrated or converged upon the surface of said body and are appearing there as straight lines, when viewed from the screen side.

3,580,759
HEAT TRANSFER ADDITIVES FOR ABSORBENT SOLUTIONS
Clarence E. Albertson, Villa Park, and Robert H. Krueger, Palatine, Ill., assignors to Borg-Warner Corporation, Chicago, Ill.
No Drawing. Filed June 25, 1968, Ser. No. 739,629
Int. Cl. C09k *3/02*
U.S. Cl. 252—71 **8 Claims**

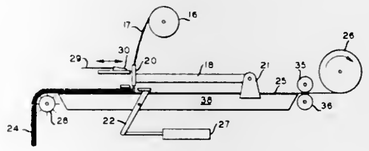
Improved heat transfer additives for lithium bromide absorbent solutions are selected from a class of tertiary alcohols. The tertiary alcohols have greater oxidative stability and, therefore, do not react as rapidly with the chromate corrosion inhibitors which are commonly used in the absorbent solutions. In all cases, the heat transfer improvement is at least as good as known, less stable, primary (and secondary) alcohols.

3,580,760
PROCESS OF MAKING LAMINATED WOOD PRODUCT UTILIZING MODULUS OF ELASTICITY MEASUREMENT
Peter Koch, Alexandria, La., assignor to the United States of America as represented by the Secretary of Agriculture
Continuation-in-part of application Ser. No. 429,175, Jan. 29, 1965. This application May 29, 1969, Ser. No. 829,103
Int. Cl. G01b *5/00*
U.S. Cl. 156—64 **3 Claims**



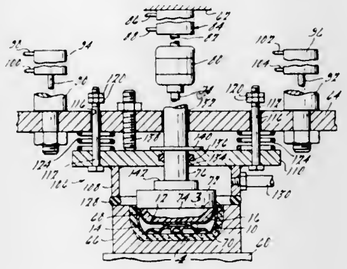
This invention relates to a process for producing laminated structures, and more specifically laminated beams, whereby the entire product of logs or bolts of wood is utilized, regardless of the presence of undesirable properties inherent in the lumber cut from said logs or bolts. Laminae are obtained from the logs by any convenient cutting method, dried to a low moisture content, relatively graded according to their deflection under a standard load at their center while supported near their end points, then arranged into a laminated structure with those laminae that have the greatest deflection in the center of the structure and those with progressively less deflection located away from the center such that the least deflective laminae are furthest from the center of the structure, and the laminae are then bonded by an adhesive.

3,580,761
METHOD OF FORMING NONWOVEN ARTICLES BY FUSING STRANDS TO A BASE
Harold D. Boultinghouse, Bartlesville, Okla., assignor to Phillips Petroleum Company
Filed Dec. 2, 1966, Ser. No. 598,682
Int. Cl. D04h *11/00*
U.S. Cl. 156—72 **5 Claims**



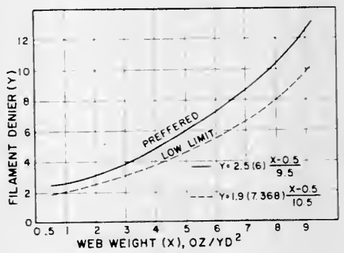
1. A method of bonding meltable material to a receptive base which comprises
(a) passing at least one strand of said material through a hollow, tubular passage and through a restricted extremity thereof to project said material slightly beyond said extremity,
(b) melting at least a portion of the projecting material,
(c) contacting the thus melted material with said receptive base to bond said material to said base, and
(d) separating the passage and base to draw said material through said passage.

3,580,762
METHOD OF MAKING DOUBLE-WALLED PLASTIC ARTICLES
Fred R. Zumstein, Detroit, Mich., assignor to King-Seeley Thermos Co., Ann Arbor, Mich.
Filed Jan. 23, 1969, Ser. No. 793,301
Int. Cl. B32b *31/00;* **C09j**
U.S. Cl. 156—73 **4 Claims**



A method of making double-walled, heat insulating plastic tableware or other plastic articles of a type having radially spaced inner and outer sets of seating and mating surfaces fused together by a spin welding operation.

3,580,763
METHOD OF PRODUCING FIBER-REINFORCED FOAM PRODUCTS
Gaspard X. Criner, Cary, and William A. Blackburn, Chapel Hill, N.C., assignors to Monsanto Company, St. Louis, Mo.
Continuation-in-part of application Ser. No. 578,073, Sept. 8, 1966. This application Mar. 13, 1969, Ser. No. 820,033
Int. Cl. B32b *5/18*
U.S. Cl. 156—78 **1 Claim**



Flexible fiber-reinforced foam products, comprised of unitary cellular structure foam bodies, the foam bodies having a fiber content comprising a multiplicity of staple fibers randomly oriented in a multi-directional pattern and distributed with uniform randomness throughout the body, the fiber content per unit area being at least the amount determined with respect to the denier by the equation:

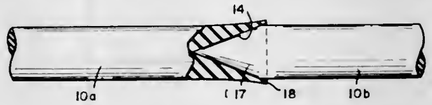
$$y=1.9(7.368)^{\frac{x-0.5}{10.5}}$$

where y=fiber denier and x=web weight in ounces per square yard, are produced by forming a nonwoven web consisting of randomly oriented fibers of controlled interfiber cohesion and porosity, dispensing a foamable mixture onto the web, and then compressing the foam-covered web.

3,580,764
MANUFACTURE OF BODIES FROM A BUNDLE OF BONDED RESIN TUBES
Fritz Gerlach, Weil am Rhein, Toni Hauskrecht, Haltingen, and Hermann Holch, Lorrach, Germany, assignors to Lonza-Werke GmbH, Weil am Rhein, Germany
No Drawing. Filed July 5, 1967, Ser. No. 651,138
Claims priority, application Switzerland, July 5, 1966, 9,764/66
Int. Cl. B32b *31/14*
U.S. Cl. 156—83 **6 Claims**

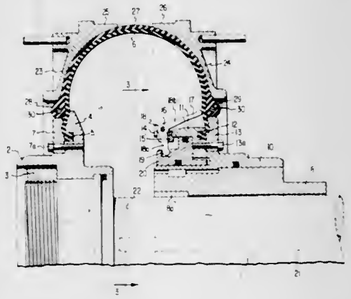
Parallel substantially rigid resin tubes are assembled to a bundle in which the tubes are mechanically held together; the bundle is then subjected to a treatment which swells and softens the contacting surfaces of the tubes whereby the tubes are bonded together under the pressure developed by the swelling action. Finally, the bundle is dried under said pressure while the tubes are still mechanically held together, and then the bundle is removed as a coherent body from the holding means.

3,580,765
RESILIENT O-RING AND METHOD OF MANUFACTURE
Marvin H. Grove, Houston, Tex., assignor to M & J Valve Company, and M & J Development Company, both of Houston, Tex.
Filed Apr. 21, 1969, Ser. No. 817,651
Int. Cl. B29h *5/02;* **F16j** *9/00*
U.S. Cl. 156—110 **3 Claims**



A resilient O-ring characterized by a particular type of junction between the ends of cured resilient stock. A conical cavity is formed in one end of the stock and a conical taper on the other end, the taper being on an included angle greater than that of the cavity. After applying cement the two parts are forced together with radial expansion at the junction. The junction is then trimmed away to the dimensions of the stock.

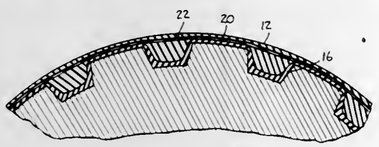
3,580,766
METHOD FOR MANUFACTURING PNEUMATIC TIRES
Antonio Pacciarini, Milan, and Renato Caretta, Gallarate, Italy, assignors to Pirelli S.p.A., Milan, Italy
Filed Mar. 13, 1968, Ser. No. 712,749
Claims priority, application Italy, Mar. 15, 1967, 13,715
Int. Cl. B29h *17/10*
U.S. Cl. 156—123 **4 Claims**



A method for the manufacture of pneumatic tires wherein the tire carcass is positioned on two annular supporting

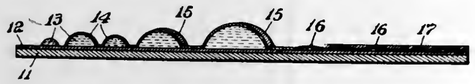
surfaces and freely shaped by mutually approaching the latter and by admitting compressed fluid inside the carcass. The shaped carcass is subjected to a slight axial compression from the portion of the carcass containing the bead cores to the proximity of its median plane by means of two rigid, equal and opposite surfaces having a toroidal profile axially narrower than that corresponding to the ideal shape of the freely shaped carcass, these surfaces being spaced from each other during the compression to define a space over the mid-circumferential portion of said carcass. The tire tread band may then be applied over the mid-circumferential portion of the carcass and between said surfaces.

3,580,767
METHOD OF MAKING A TOOTHED DRIVE BELT WITH AN ABRASION RESISTANT URETHANE COATING ON THE TRANSMISSION SURFACE
Gerald L. Barnes, Palatine, Ill., and Raymond G. Cichy, South Bend, and Gerald E. Adams, Mishawaka, Ind., assignors to Uniroyal, Inc., New York, N.Y.
Filed Mar. 28, 1969, Ser. No. 811,514
Int. Cl. F16g *1/00;* **B29n** *7/22*
U.S. Cl. 156—138 **7 Claims**



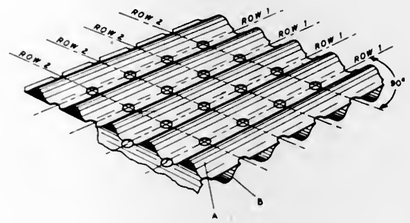
A toothed belt to be used in a positive transmission drive, and a method for manufacturing the said belt. According to the method, a grooved mandrel is coated with a skin coating of a wear and abrasion resistant elastomeric material. A highly viscous tooth filler compound, which is also an elastomeric material, is then applied filling the grooves of the mandrel and covering the entire surface of the skin coating forming the major portion of the belt teeth. Either before or after the filling of the grooves with the filler compound, and before the curing of the filler compound, a reinforcing filament is helically wound around the mandrel and at least partially embedded within the filler compound. Thereafter the mandrel and said coatings are placed in an oven and cured. The cured belt can then be stripped from the mandrel and may be cut into individual belts of smaller width if desired. The belt resulting from this method will have a wear and abrasion resistant elastomeric coating which covers a less wear resistant elastomeric layer. The reinforcing filament is separated from the teeth of the gears which coact with the belt by the wear and abrasion resistant coating.

3,580,768
METHOD OF FORMING DECORATIVE THREE DIMENSIONAL EFFECT DESIGNS AND COATINGS
Stanley Kukla, 1161 Summit Ave., Jersey City, N.J. 07307
Filed Nov. 29, 1967, Ser. No. 686,421
Int. Cl. B29c *24/00*
U.S. Cl. 156—156 **6 Claims**



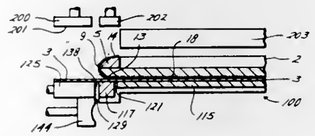
A method of forming decorative three dimensional effect designs and coatings on the smooth surface of a base material by painting the surface, applying drops of liquid or chips of frozen liquid to the painted surface while the paint is wet, drying the paint surrounding the drops or chips, spraying paint over the entire surface to cover the drops or chips, respraying the surface with paint of another color from an angle of zero to sixty degrees to the surface to create highlight and depth effects, removing the liquid entrapped under the paint film by rolling the surface, drying the painted surface, applying a protective coating to the dried design.

3,580,769
METHOD OF MAKING CORRUGATED THERMOPLASTIC ARTICLES
Phillip H. Parker, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Original application Apr. 5, 1968, Ser. No. 719,147. Divided and this application Jan. 19, 1970, Ser. No. 4,086
Int. Cl. B31f *1/22*
U.S. Cl. 156—206 **11 Claims**



Corrugated thermoplastic articles are made by simultaneously perforating in closely spaced parallel rows at least two uniaxially oriented sheets of thermoplastic polymer in intimate contact at an angle of at least about 10° relative to orientation with heat to at least fusion temperature of the thermoplastic, cooling fused peripheries of the perforations and annealing the perforated films.

3,580,770
METHOD FOR PRODUCING LAMINATED STRUCTURES
Gilford E. Dyal, San Antonio, Tex., assignor to Tripro, Inc., San Antonio, Tex.
Filed Jan. 31, 1967, Ser. No. 612,938
Int. Cl. B32b *3/04*
U.S. Cl. 156—216 **14 Claims**



Postforming facing sheets such as the C-stage laminates are bonded to and around the returning peripheral edges of a planar polygonal core by a process involving heating only the peripheral outer portions of the sheet and bonding the outer portions of the sheet to the core with a heat activated adhesive while the main portion of the sheet is bonded to the core by a contact adhesive.

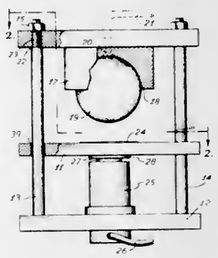
The apparatus for this method has a support surface surrounded by two sets of heating bars which heat only the outer portions of the sheet with the outer set of heating bars being movable relative to the core to wipe the sheet around the core after the sheet is heated to postforming temperature by the heater bars. The apparatus

has a lower mechanism comprising the support and heaters and an upper mechanism having elements which exert downward pressure to enable positioning heating and bending of the sheet to the core.

3,580,771
METHOD FOR RENDERING AN IRREGULAR SURFACE SMOOTH UTILIZING DIRECT CONTACT TRANSFER
Kent N. Maffitt, Minneapolis, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.
Filed Apr. 13, 1967, Ser. No. 630,704
Int. Cl. B44c *1/00*
U.S. Cl. 156—235 **5 Claims**

A method for smoothing minute irregularities in the surface of magnetic recording tape. A thermoplastic material is applied to the tape oxide surface and the tape then is disposed against a gold-coated flat casting surface while heat and pressure are applied. Thermal shock from applied liquid nitrogen causes release of the coated tape from the casting surface. A weighted roller on the apparatus applies pressure to the tape.

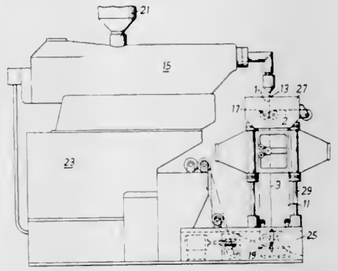
3,580,772
METHOD AND APPARATUS FOR THE TRANSFER OF IMAGES ONTO SURFACES OF HOLLOW ELASTOMERIC ARTICLES
Alfonso Vergara Ochoa, Tepeyac 1287, Guadalajara, Jalisco, Mexico
Filed May 16, 1967, Ser. No. 638,964
Claims priority, application Mexico, Feb. 6, 1967, 93,867
Int. Cl. B44c *5/00*
U.S. Cl. 156—240 **10 Claims**



A process for the transfer of images from a flat film onto the surface of moderately irregular hollow elastomeric articles, which comprises printing a film with an ink having a resin base incompatible with the resin of said film, applying a layer of a resin varnish on the surface of said printed film or on the surface of the article, said varnish having a resin base compatible with the base of said ink and with the resin of which said article has been formed, applying said film on the surface of said elastomeric article, inflating the article in order to extend and tighten the film on its surface, while the varnish is still on its mordant state, allowing the varnish to dry, and peeling off the film from the surface of said article whereby the printed image will be transferred unto the surface of said article.

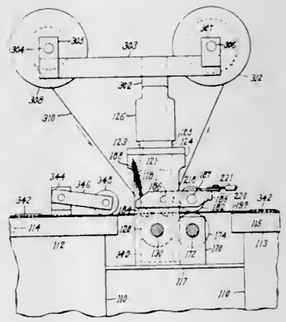
An apparatus for carrying out the above described process which comprises a hydraulic press with a flat movable lower platen to accommodate a printed film and a concave fixed upper platen with means for supporting an irregular hollow article, and means for displacing said lower platen to contact said film with the article supported by the upper platen whereby the film will be adhered thereto.

3,580,773
APPARATUS FOR MOULDING ARTICLES FROM PLASTICS MATERIAL
Jack Marvin Schneider, Kingswood, England, assignor to Calmec Extruform Limited
Filed Apr. 19, 1967, Ser. No. 631,959
Claims priority, application Great Britain, Apr. 22, 1966, 17,699/66
Int. Cl. B29f *3/00*
U.S. Cl. 156—244 **7 Claims**



A composite sheet of thermoplastics material is formed by bonding together a first, extruding sheet and a second, preformed sheet of cheaper material. The second sheet has a series of identification marks printed thereon at locations spaced lengthwise of the sheet and a series of register marks. Articles are formed by feeding the composite sheet from the bonding means to an article-forming apparatus. Means are provided for detecting the arrival of a register mark at a predetermined location on the path of the second or the composite sheet and controlling the operation of the article-forming apparatus so that each article bears an identification mark at a predetermined location thereon.

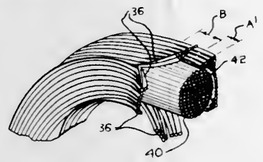
3,580,774
METHOD FOR COATING WORK PIECES WITH THERMOPLASTIC MATERIAL
Terence J. L. Clarke, Leicester, England, Ivor Evans, deceased, late of Leicester, England, by Josie V. Evans, administratrix, Cossington, England, assignors to United Shoe Machinery Corporation, Flemington, N.J.
Filed Sept. 6, 1967, Ser. No. 667,323
Claims priority, application Great Britain, Sept. 9, 1966, 40,366/66; Dec. 9, 1966, 55,212/66; Feb. 14, 1967, 6,894/67
Int. Cl. B23b *31/12*
U.S. Cl. 156—247 **3 Claims**



A method of coating sheet material work pieces with thermoplastic adhesive material is provided by the present invention. According to the method, work pieces are

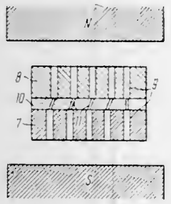
assembled between a layer of thermoplastic adhesive material and a layer of stripper material suitably newsprint, and the assembly is subjected to heat and pressure. The coated work pieces and the stripper layer are separated while the thermoplastic adhesive is in heat softened condition, the stripper material retaining surplus adhesive material. Suitably, the layer of thermoplastic adhesive material is a film, preferably supported on a layer of release material, suitably silicone paper, which enhances the cleanliness of the pressing operation and which upon separation serves to retain the work pieces while surplus thermoplastic adhesive material is removed on the stripper layer.

3,580,775
METHOD OF MAKING FIBERSCOPES WITH TRIMMED TIPS
Walter P. Siegmund, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.
Filed Apr. 28, 1969, Ser. No. 819,791
Int. Cl. B32b *17/02;* **G02b** *5/16*
U.S. Cl. 156—247 **5 Claims**



Fiberscopes formed of a multiplicity of accurately superimposed circular fiber ribbons. A portion of the length of each ribbon is coated in one zone with a material of high glass-bonding strength and with a strip of an adhesive parting agent at each side of the high strength bonding material. The coated portions are accurately superimposed and cured at an elevated temperature to produce a high strength bond centrally of the coated portions through which a cut is made to form opposite ends of the fiberscope. These ends are cut, ground, sawed or core drilled partially into adjoining areas of the adhesive parting agent to provide the fiberscope with tips of a desired shape and size whereupon trimming of the remaining length of the fiberscope to a corresponding shape and size is effected by delamination.

3,580,776
METHOD OF PRODUCING ELECTRIC CONTACT BETWEEN TWO CEMENTED PARTS
Leonid Zalmanovich Shenfil, 1 Cherkivovskaya yl. 60, kv. 3; Valentin Evgenievich Gul, Zelenodolskaya 33, korp. 1, kv. 10; Galina Konstantinovna Melnikova, 1 Basmanny per. 12, kv. 23; Nina Isidorovna Siprikova, B. Zjuzinskaya ul. 10, korp 12, kv. 22; Maiya Konstantinovna Rozhdestvenskaya, Lenisky prosp. 101, korp. 179, kv. 22; and Alexandr Nikitichna Kuzina, N. Khoroskevskoe shoss 18, korp. 4, kv. 8, all of Moscow, U.S.S.R.
Filed June 9, 1967, Ser. No. 645,038
Int. Cl. B29c *19/06*
U.S. Cl. 156—275 **7 Claims**



A method is provided for producing an electric contact by means of a current-conducting cement constituted as a hardening epoxy resin containing a current-conducting ferrogmagnetic filler. The cement film is hardened in a non-uniform magnetic field having a variable intensity across the field section, and initially a pulsating magnetic field is applied having a frequency of 0.1 to 1000 c.p.s. when the static component of magnetic induction has a value of 50 to 15,000 gausses and when the amplitude is within the range of 10 to 5000 gausses.

3,580,777
METHOD OF BONDING ASBESTOS SHEET MATERIAL TO CONCRETE
Rowland S. Hartzell, Gibsonia, Pa., and Gene Gerek, Oswego, Ill., assignors to PPG Industries, Inc., Pittsburgh, Pa.
No Drawing. Continuation-in-part of application Ser. No. 528,347, Feb. 18, 1966. This application Dec. 2, 1968, Ser. No. 780,587
Int. Cl. B23b *31/00*
U.S. Cl. 156—278 **8 Claims**

Composite coated concrete articles having a surface coating of a cured or other resinous material comprise a cementitious base and adherently bonded thereto a layer of asbestos sheet material which is coated with an organic coating. Such articles can be obtained by curing the cementitious base while in contact with the uncoated side of pre-coated asbestos sheet material to produce concrete articles in which the coated asbestos sheet material is directly bonded to the concrete with exceptional adhesion.

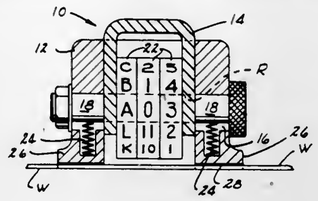
3,580,778
METHOD AND APPARATUS FOR PLYWOOD PANEL LAY-UP
Charles L. Larson, Grants Pass, Oreg., assignor to Jeddeloh Bros. Sweed Mills, Inc., Gold Hill, Oreg.
Filed June 27, 1968, Ser. No. 740,676
Int. Cl. B32b *31/06, 31/12*
U.S. Cl. 156—299 **9 Claims**

Apparatus and method for laying up plywood panels. Included in the apparatus is a veneer conveyer for carrying a series of presized veneer sheets in one direction, and a core conveyer spaced above the veneer conveyer for carrying core pieces in the same direction. The core conveyer converges on the veneer conveyer to place core pieces on the veneer sheets at a placement station. Supply means upstream from the placement station deposits a charge of multiple core pieces on the core conveyer, with the grain of the core pieces extending transversely of the core conveyer. Glue sprayers are supported above the veneer conveyer, with one upstream of the placement station and another downstream of the placement station. And these apply glue to the upper faces of the veneer sheets and the upper faces of the core pieces, respectively.

3,580,779
HAND OPERATED TOOL FOR MARKING WIRE
Fred G. Schriever and Sigmund Cheslin, both of 16333 Harper Ave., Detroit, Mich. 48224
Filed Oct. 21, 1966, Ser. No. 588,534
Int. Cl. B32b; B41m
U.S. Cl. 156—384 **4 Claims**

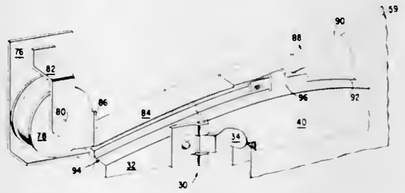
This invention is directed to a portable hand tool used for on the job identification of wire, wherein adhesive tape is printed with selected indicia by the operator and

dispensed at the will of the operator for manual or automatic application to the wire at the desired locations, or



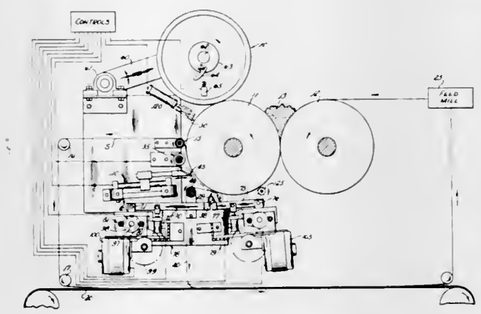
the indcia can be applied directly to the wire or other cylindrical object.

3,580,780
METHOD AND APPARATUS FOR BAR SEALING OF GIRDLE PANELS
Herbert G. Klawunn, Millington, and John Addison Herr, Garwood, N.J., assignors to The Singer Company, New York, N.Y.
Filed May 7, 1969, Ser. No. 822,627
Int. Cl. B29c *27/04*
U.S. Cl. 156—380 **7 Claims**



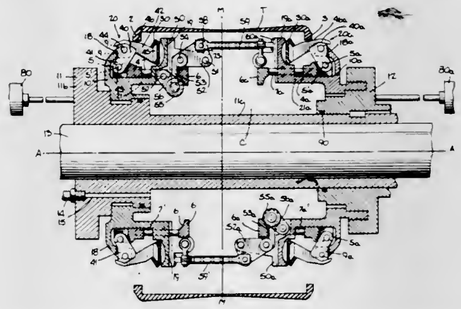
This disclosure relates to a method and apparatus for bar sealing of girdle panels to form curved side seams, initially held in place by clamping and folding the same over a curved sealing die, which is subsequently mated with a second die along the seam to effect a seal, thermally or dielectrically.

3,580,781
APPARATUS FOR BUILDING UP TREAD MATERIAL ON A TIRE CARCASS
Jack Lyndon Hollis, Pottstown, Pa., and Ray Douglas Shockey, Uniontown, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio
Continuation of abandoned application Ser. No. 316,287, Oct. 15, 1963. This application May 20, 1968, Ser. No. 740,795
Int. Cl. B29h *17/20*
U.S. Cl. 156—397 **4 Claims**



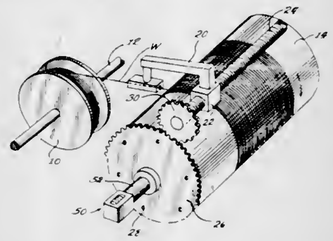
A tire carcass supported in rotating contact with a roll picks up rubber tread material from the roll to build up the desired contour of tread material on the carcass. Cutters on the roll separate a sheet of tread material into a plurality of ribbons, at least one of which is removed from the roll before the roll contacts the tire carcass. The cutters are positioned to vary their spacing and thus change the ribbon widths. By removing the center strip, tread material in the shoulder areas can be built up as desired.

3,580,782
APPARATUS FOR SHAPING TIRES
Jean Leblond, Compiegne, France, assignor to Uniroyal Englebert France S.A., Paris, France
Filed Sept. 12, 1968, Ser. No. 759,401
Claims priority, application France, Sept. 15, 1967, 121,259
Int. Cl. B29h *17/26*
U.S. Cl. 156—415 **35 Claims**



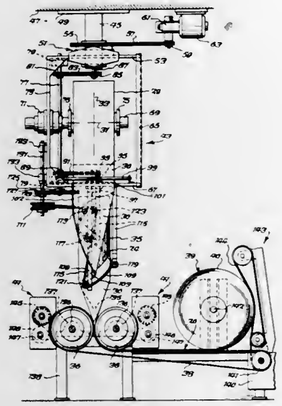
A tire building machine comprising a pair of variably spaced carcass support rings coaxially disposed with respect to each other and providing for direct inflation of a first stage carcass supported thereon. At least one of the rings includes an expandible and contractible elastic band for sealingly engaging the respective bead of the carcass.

3,580,783
METHOD OF PRODUCING MULTITUDINOUS STRAIGHT CUT-TO-LENGTH FILAMENTS IN ORIENTED FORM
Ardelle Glaze, Fort Wayne, Ind., assignor to Fort Wayne Metals, Inc.
Filed Jan. 4, 1968, Ser. No. 695,633
Int. Cl. B31c *11/02*
U.S. Cl. 156—426 **1 Claim**



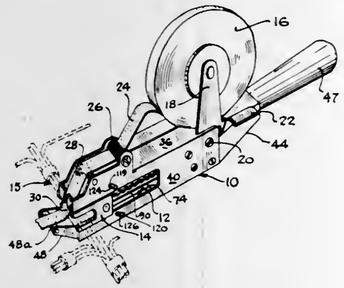
Small diameter wire which has been prestressed is arranged in a plurality of substantially parallel or otherwise oriented strands which are bound together by a readily removable adhesive and thereafter cut to desired size. The adhesive binding the individual, cut strands together may or may not be removed to provide either a plurality of prearranged strands of wire bound together into nonwoven cloth or a mass of individual strands oriented in parallel or other relationship.

3,580,784
APPARATUS FOR MAKING A BIAS LAID RIBBON
Charles A. Lee and Warren R. Furbeck, Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.
Filed Apr. 9, 1968, Ser. No. 719,986
Int. Cl. B65h *81/02*
U.S. Cl. 156—429 **13 Claims**



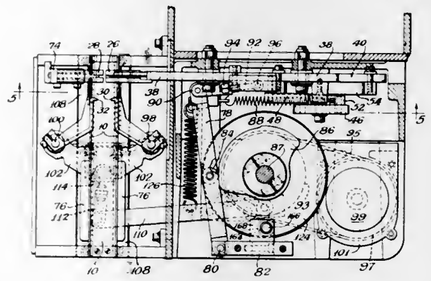
A multi-ply ribbon is formed by apparatus in which at least one web of material is wound spirally about a mandrel and then stripped and flattened. To reduce inertia and gyroscopic forces encountered when unwinding a web parent roll about its longitudinal axis while it is spinning relative the mandrel about another axis, the parent roll is mounted in a rotatable carrier at one end of the mandrel with the respective axes being substantially coplanar. The mandrel may be suspended from the carrier and driven in a direction reverse to that of the carrier so that the mandrel remains stationary relative to nip rolls. The preferred ribbon is formed of bias laid, superimposed plies of creped tissue and has the surfaces of the ribbon textured by spaced depressions at which fibers in one ply are interlocked with fibers in an adjacent ply.

3,580,785
TAPE WRAPPING APPARATUS WITH TRAVELING WHEEL GEAR
Peter Mihalkanin, 1224 Maple Ave., Berwyn, Ill. 60402
Filed Sept. 3, 1968, Ser. No. 756,896
Int. Cl. B65b; B65c *3/02*
U.S. Cl. 156—468 **16 Claims**



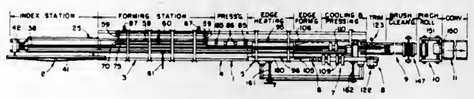
A taping apparatus particularly adapted to operate as a portable hand unit for peripherally wrapping a work piece with flexible adhesive tape. A split wheel gear is rotatable in a uniform rotational direction between elongated rack gears. The wheel gear is translated in a first direction in driving engagement with one rack while the other rack is displaced longitudinally and away from the first rack. The wheel gear continues its uniform rotation by disengaging from the first rack and engaging the other rack in driving relationship during translation in the opposite direction. During such translation in both directions, the tape is initially wrapped around the work piece, is cut, and is finally wrapped around the work piece.

3,580,786
BANDING APPARATUS FOR STACKED ARTICLES
James E. Doane, 340 13th Ave. S., Naples, Fla. 33940, and Robert C. Sheriff, 1401 Elm Ave., Round Lake, Ill. 60073
Filed June 30, 1967, Ser. No. 650,296
Int. Cl. B65b *13/06;* **B65c** *1/04*
U.S. Cl. 156—475 **10 Claims**



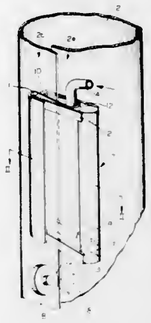
Apparatus for adhering a band around stacked articles such as labels, facing slips and the like wherein a combination of clampnig jaws operate to adhere ends of the bands around individual stacks and sever the bands between stacks, and transport claws engage the banded stack to advance it along a trough to a discharge position. Heating elements are provided for the clamping jaws and the sides of the trough if the bands are of heat-seal type.

3,580,787
PLASTIC LAMINATING APPARATUS
George W. Loy, Scio, Ohio, assignor to Scio Cabinet Company, Inc., Scio, Ohio
Filed Dec. 15, 1969, Ser. No. 885,014
Int. Cl. B32b *31/26*
U.S. Cl. 156—477 **22 Claims**



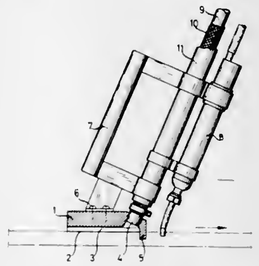
A plastic laminating apparatus for laminating plastic sheet material to a countertop core having a backsplash attached at right angles thereto during a single pass through the apparatus. The apparatus consists of a plurality of longitudinally spaced work stations through which the work is successively moved for progressively shaping and adhering the plastic laminate to the work, such work being guided through the apparatus by receipt of a downwardly projecting portion from the work in a guide track extending the entire length of the apparatus. A back die bends the laminate to conform to the general shape of the backsplash and countertop after heating, and fingers and pressure rolls are used to progressively bend and press the projecting edges of the laminate into firm-contact with the edges of the countertop and backsplash. Floating cutters are also used to trim the excess laminate material extending beyond the countertop and backsplash edges, and such excess material may be picked up by a suction blower or removed by a rotary brush prior to passage through final pressure rolls.

3,580,788
APPARATUS FOR FORMING A TUBE FROM A TRAVELLING WEB
Ake Gustafson, Chatel-Saint-Denis, Switzerland, assignor to Tetra Pak AG, Zurich, Switzerland
Filed Sept. 28, 1967, Ser. No. 671,451
Claims priority, application Switzerland, Sept. 28, 1966, 13,998
Int. Cl. B32b *31/00*
U.S. Cl. 156—497 **1 Claim**



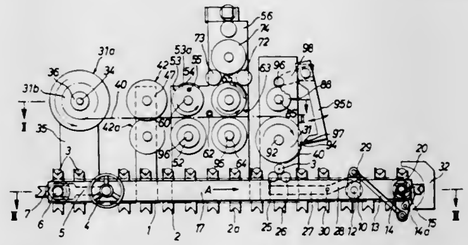
A travelling web of material is formed into a tube with at least one of the longitudinal edges of the web passing through a heating means supplied with heated air. The two edges of the web are pressed together to form a welded seam after passing through the heating means. The heating means comprises a heating chamber having an internal lining of a non-adhering material. An air pipe opens into the chamber with means for supplying heated air. The lining is attached to the exterior surface of the heating chamber and is passed around the air pipe and has a vertical slit-shaped opening through which one edge of the travelling web can project into the interior of the heating chamber.

3,580,789
WELDING GEAR FOR OBJECTS OF THERMOPLASTIC MATERIAL
Günter Wenzel, Kelkheim, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
Filed July 9, 1968, Ser. No. 743,487
Claims priority, application Germany, July 25, 1967, F 53,049
Int. Cl. B32b *31/30*
U.S. Cl. 156—497 **5 Claims**



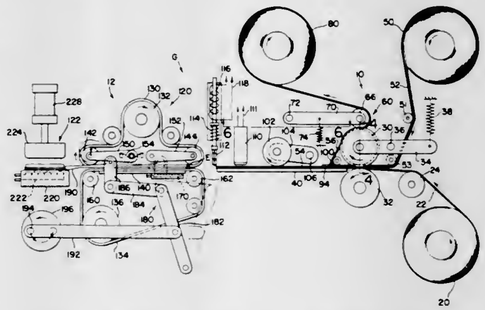
The spout or shoe of a welding gear for objects of thermoplastic materials, by means of which fully plasticized welding material is brought into a prepared welding gap, comprises, between two lateral guide surfaces, a smoothing face, a connection for the supply of the welding material and at its leading end a nose projecting into the welding gap.

3,580,790
APPARATUS FOR THE AUTOMATIC WRAPPING OF ROTATABLE BODIES
Heinz Pollmeier, Rosrath, Bezirk Cologne, and Johann Witthuhn, Furstendamm, Germany, assignors to Klebetechnik GmbH, Dusseldorf, Germany
Filed Apr. 23, 1969, Ser. No. 818,738
Claims priority, application Germany, May 6, 1968, P 17 60 342.8
Int. Cl. B65c *3/16, 9/04*
U.S. Cl. 156—521 **12 Claims**



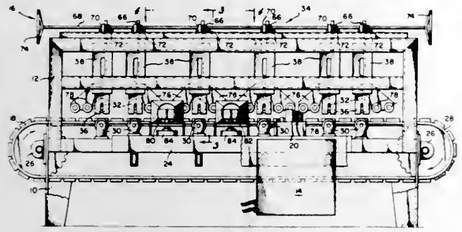
Apparatus for the automatic wrapping of rotatable bodies. The bodies are supported and moved into a wrapping position located beneath a suction roller which applies a foil strip to the rotatable body. The foil strip may be printed on and is automatically fed to the suction roller by various roller pairs. All of the operations are correlated so as to intermittently feed a single rotatable body to a wrapping work station simultaneously with the foil strip. The wrapped rotatable body is then carried to a discharge point on the apparatus.

3,580,791
DEVICE FOR APPLYING A BAND OF THERMOSETTING MATERIAL ONTO A LABEL AND FOR SEALING THE LABEL ONTO AN ARTICLE
Grant H. Jordan, Parma, Ohio, assignor to American Greetings Corporation, Cleveland, Ohio
Filed June 19, 1968, Ser. No. 738,173
Int. Cl. C32b *31/00*
U.S. Cl. 156—540 **20 Claims**



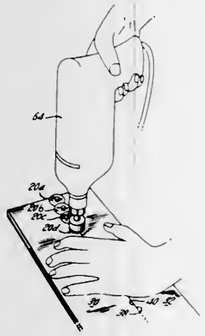
There is provided a device for producing a label with a band of thermosetting material on one side thereof for subsequent heat sealing of said label onto an article. This device comprises a means for moving a strip of label stock and an adhesive strip having a thermosetting layer and a backing strip along a feedline with the thermosetting layer adhered to said strip of label stock. A parting member pulls the backing strip from the adhesive strip while a stripper member prevents the backing strip from pulling the thermosetting layer from the label stock, and a cutting means cuts the label stock into separate labels. There is provided a further device for then heat sealing the label onto a package formed from thin plastic film material.

3,580,792
LUMBER AND VENEER JOINTER
Andrew M. Kvalhelm, 823–825 Petaluma Blvd. S., Petaluma, Calif. 94952, and Bob L. McEvers, 7300 SW. Child Road, P.O. Box 28, Tualatin, Oreg. 97062
Filed May 23, 1968, Ser. No. 731,525
Int. Cl. B32b *31/12;* **B29c** *19/00;* **B27d** *3/00*
U.S. Cl. 156—546 **15 Claims**



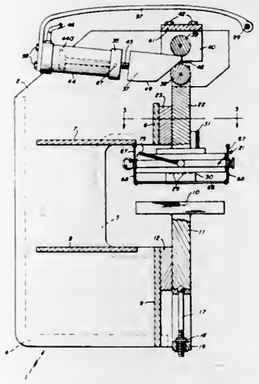
A machine for jointing lumber on both longitudinal edges, simultaneously, by squaring said edges, and by applying glue, if desired, so that the finished lumber piece is ready for joining with other like pieces to form a panel. Either veneer or lumber strips may be prepared by the machine. The machine comprises a tubular frame assembly, an endless chain conveyor assembly for passing lumber to be treated through the machine, series of top and bottom hold-down rollers for guiding the lumber through the machine, and a pair of cutter assemblies for simultaneously finishing the longitudinal edges, each said cutter assembly being incrementally movable inwardly and outwardly with respect to the long axis of the machine by means of a positioning set works assembly, remotely controlled. The machine also includes a pair of glue applicators for applying glue to the finished lumber edges, and a top, hold-down roller assembly, each hold-down roller being individually actuable to a hold-down position, or, alternatively, the entire bank of rollers may be simultaneously actuable to a hold-down position. A vertical adjustment assembly is provided for setting each roller in a pre-determined hold-down position; the adjustment mechanism sets all top rollers simultaneously.

3,580,793
APPARATUS FOR WELDING THERMOPLASTIC SHEET MATERIAL
Eugene E. Hewitt, Walkerton, Ind., assignor to Uniroyal, Inc., New York, N.Y.
Original application Aug. 19, 1966, Ser. No. 573,688, now Patent No. 3,468,732, dated Sept. 23, 1969. Divided and this application Apr. 21, 1969, Ser. No. 840,570
Int. Cl. B29c *27/08;* **B23b** *31/10*
U.S. Cl. 156—579 **3 Claims**



Apparatus for welding thermoplastic sheet material including conical shaped thermoplastic buttons spun welded to join mating edges of two thermoplastic sheets and a friction driver mountable in a hand drill for spinning buttons.

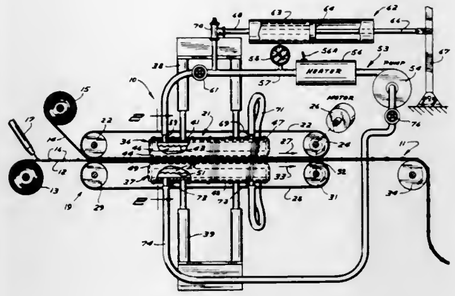
3,580,794
STAMPING PRESS WITH LINEARLY APPLIED FORCE
Leonard A. Mintz, 27 Kettering Road, Norwood, Mass. 02062
Filed Oct. 7, 1968, Ser. No. 765,557
Int. Cl. B30b *1/40, 15/20;* **B32b** *31/20*
U.S. Cl. 156—581 **6 Claims**



A stamping press having an air cylinder which transfers its force to a stamping head by means of a wedge forced by the air cylinder between a reaction roller and a ram driving the stamping head. During the approach stroke, one planar face of the wedge is at a substantial angle to the axis of the piston of said air cylinder, but during the pressure stroke another planar face of the wedge is disposed at a very small angle to the piston and it exerts its pressure substantially solely along the axis of travel of the stamping ram. The press also has a hand lever to rotate the air cylinder and wedge about an axis to permit hand operation of the ram. When used for roll leaf stamping a linear thrust drive is coupled to the roll leaf to advance it in the same direction upon both directions of motion of said thrust drive.

3,580,795
APPARATUS FOR WELDING HEAT SEALABLE SHEET MATERIAL
John E. Eichenlaub, 9321 Franklin Ave. W., Minneapolis, Minn. 55426
Continuation-in-part of application Ser. No. 584,564, Oct. 5, 1966. This application Dec. 1, 1969, Ser. No. 881,250
Int. Cl. B30b *15/34;* **B32b** *31/20*
U.S. Cl. 156—583 **24 Claims**

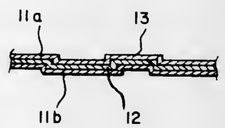
An apparatus for welding heat sealable sheet material with heated fluid moving through a platen having a chamber. The chamber is closed with a flexible, nonelastic, thin cover having a surface area exposed to the chamber that is larger than the transverse area of the chamber, whereby the cover is moved by the pressure of the fluid in the chamber without elongating or deforming the cover to transmit force and heat to a surface of the sheet material. The cover is urged toward the sheet material by the heated fluid under pressure which transmits both heat and pressure to the sheet material to weld the material. The platen may be provided with fluid in a vapor phase to provide the platen with totally uniform pressure on the cover which adjusts to the irregularities on the surface opposing the cover. The vapor also maintains, through condensation of the vapor, a uniform surface temperature on the cover. The condensed liquid is returned from the chamber back to a vapor generating source.



3,580,796
GLASS LAMINATED BY AN ADHESIVE COMPRISING THE POLYURETHANE RESULTING FROM THE REACTION OF BIS(2-ISOCYANATOETHYL) FUMARATE WITH POLYOLS WITHOUT OTHER ISOCYANATE
Robert M. Hick, Jr., Springfield, and Joseph C. Gould, Norwood, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington Del.
No Drawing. Filed Mar. 16, 1967, Ser. No. 623,566
Int. Cl. B32b *17/10, 27/40*
U.S. Cl. 161—190 **7 Claims**

A composite article is prepared by (a) providing a liquid polyurethane by reacting bis (2-isocyanatoethyl) fumarate with a polymeric polyol component which preferably comprises a triol obtained from propylene oxide and 1,2,6-hexanetriol, and (b) using said polyurethane to coat a layer of glass or acrylic plastic or to bond said layer (e.g., a windshield) to another layer of solid material (e.g., an auto body) with a cured bond which is highly resistant to adhesive failure when the article is exposed to sunlight and outdoor weather for extended periods of time.

3,580,797
TABLE COVER
James E. Asmuth, Neenah, Wis., assignor to Wisconsin Tissue Mills, Menasha, Wis.
Filed Aug. 22, 1969, Ser. No. 852,390
Int. Cl. B32b *1/00, 3/02*
U.S. Cl. 161—126 **4 Claims**



A table cover comprising at least one ply of thin cellulosic tissue and an additional ply of thin polyethylene film which is superimposed in an edge aligned relation with the first ply. The plies are secured in a laminated relation by embossing in areas of substantial width extending along the marginal edges to form a border for the table cover and to completely surround a central area which is substantially free of embossing. The border forming embossed marginal areas are of substantially uniform width and extend inwardly along the opposite side edges of the table cover from the original untrimmed marginal side edges.

3,580,798
BIAXIALLY STRETCHED TRIOXANE COPOLYMER FILM AND PROCESS FOR THE PREPARATION THEREOF
Gunter Kegelmann, Neustadt an der Weinstrasse, and Horst Gebler and Walter Seifried, Wiesbaden-Biebrich, Germany, assignors to Kalle Aktiengesellschaft, Wiesbaden-Biebrich, Germany
Filed Apr. 23, 1969, Ser. No. 818,531
Claims priority, application Germany, Apr. 26, 1968, P 17 69 257.8
Int. Cl. C08f *15/12;* **C08g** *1/04;* **D01d** *5/12*
U.S. Cl. 161—165 **4 Claims**

The invention relates to a biaxially stretched film and process for the preparation thereof, the film being a high molecular weight linear trioxane/ethylene oxide copolymer having stabilized end groups and containing 80 to 99.9 percent by weight of trioxane based on the total weight of the polymer, the film exhibiting a sag of less than 0.2 percent characteristic for a flat film, a deviation in thickness of less than ±6 percent from the average thickness, an elastic modulus in all directions of the film plane of at least 300 kg./mm.^{2}, an ultimate tensile strength above 15 kg./mm.^{2} at an elongation at rupture of less than 100 percent, and a shrinkage capacity, at 140° C., of less than 5 percent.

3,580,799
LAMINATED PRODUCTS
Heinz Uelzmann, Cuyahoga Falls, and David C. Hidinger, Akron, Ohio, assignors to The General Tire & Rubber Company
No Drawing. Original application Sept. 28, 1967, Ser. No. 671,187, now Patent No. 3,502,618. Divided and this application Nov. 26, 1969, Ser. No. 870,530
Int. Cl. B32b *15/08, 27/38;* **C08g** *30/14*
U.S. Cl. 161—186 **9 Claims**

Epoxy resin adhesives with improved adhesive properties, e.g., higher shear strengths under conditions of shorter cure time and/or lower cure temperature, are formed from mixtures of epoxy resins and aziridinyl compounds containing catalytic amounts of compounds that have both >NH and

$$-\overset{O}{\overset{\|}{S}}-OH \text{ or } -\underset{\underset{O}{\|}}{S}-OH$$

groups, e.g., sulfamic acid or formamidine sulfinic acid.

3,580,800
METHOD FOR BONDING OLEFINIC TERPOLYMERS TO NATURAL RUBBER AND VULCANIZATES OBTAINED THEREBY
Luigi Torti and Guido Bertelli, Ferrara, Italy, assignors to The B. F. Goodrich Company, New York, N.Y.
No Drawing. Filed June 26, 1967, Ser. No. 649,039
Claims priority, application Italy, June 28, 1966, 14,823/66
Int. Cl. C09j *3/12*
U.S. Cl. 161—243 **4 Claims**

Process for bonding (1) vulcanizable composition comprising low-unsaturation ethylene/higher alpha-olefin/unconjugated diolefin terpolymer, a vulcanizing agent therefor and carbon black with (2) vulcanizable composition comprising natural rubber, a vulcanizing agent therefor and carbon black, this process comprising interposing between layers of composiitons (1) and (2) a layer of (3) vulcanizable composition comprising a brominated co-

polymer of isobutene with about 0.5–5% by weight of isoprene, a vulcanizing agent therefor and carbon black, the carbon black in composition (3) having a lower activity than the carbon black in layers (1) and (2), contacting the three layers under pressure, and then heating at a temperature of 130–210° C. to thereby covulcanize the three layers and obtain a high degree of adhesion therebetween.

3,580,801
METHOD FOR MANUFACTURING NONWOVEN FIBROUS PRODUCTS FROM GEL FIBERS
Thomas C. Spence, Yorktown, Va., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Division of application Ser. No. 567,846, July 26, 1966, now Patent No. 3,436,304, which is a continuation-in-part of applications Ser. No. 457,139, and Ser. No. 457,178, both May 19, 1965. This application July 25, 1968, Ser. No. 747,457
The portion of the term of the patent subsequent to Apr. 1, 1986, has been disclaimed and dedicated to the Public
Int. Cl. D21f *11/00;* **D21h** *5/12*
U.S. Cl. 162—157 **8 Claims**

A process for preparing a dry, nonwoven fibrous sheet, comprising:

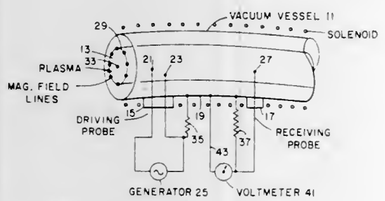
(a) forming a web of self-bonding gel fibers of thermoplastic, fiber-forming polymer of acrylonitrile, said gel fibers having a gel network structure that has never been completely collapsed by drying and that consists essentially of interconnecting capillary spaces intimately intertwined with fibrillar structure of polymeric material;

(b) subjecting said web to drying conditions between two spaced barriers which limit the physical movement of said web in its thickness direction while providing substantially no restraint to movement in the other two directions; and

(c) recovering a dry, nonwoven fibrous sheet.

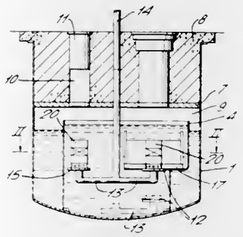
The product is useful as a textile fabric in the preparation of a variety of materials ranging from hard, boardy sheets to soft, fluffy fabrics to stretchable, tough fabrics.

3,580,802
DEVICE FOR DETERMINING THE SHAPE OF MAGNETIC SURFACES IN TOROIDAL CONFIGURATIONS CONTAINING PLASMA
John L. Johnson, Niels K. Winsor, John M. Dawson, Rolf M. Sinclair, and Joel C. Hosea, Princeton, N.J., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed Apr. 22, 1969, Ser. No. 818,374
Int. Cl. G21b *1/00*
U.S. Cl. 176—1 **5 Claims**



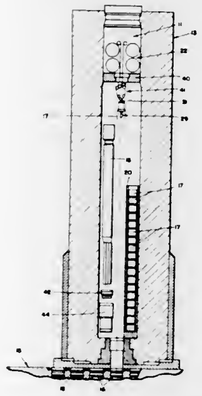
Method of surveying the shape and location of magnetic surfaces in a stellarator with an electrostatic acoustic oscillation mode that dominates ordinary sound waves associated with plasma particle motion along the magnetic surfaces.

3,580,803
NUCLEAR REACTORS
Ivor Everson, Wantage, and Maurice William George, Swerford, England, assignors to United Kingdom Atomic Energy Authority, London, England
Filed Sept. 18, 1967, Ser. No. 668,393
Claims priority, application Great Britain, Sept. 21, 1966, 42,249/66
Int. Cl. G21c *19/10*
U.S. Cl. 176—28 **8 Claims**



A nuclear reactor comprising a plurality of nuclear fuel elements grouped to form a core assembly within a reactor vessel and means are provided to transfer the said core assembly between its reactor operating station and a second non-operating station within the said vessel.

3,580,804
LIFTING MECHANISM AND REFUELING MACHINE
John A. Paget, Imperial Beach, Calif., assignor to the United States of America as represented by the United States Atomic Energy Commission
Filed Mar. 7, 1969, Ser. No. 805,156
Int. Cl. G21c *19/20*
U.S. Cl. 176—30 **11 Claims**

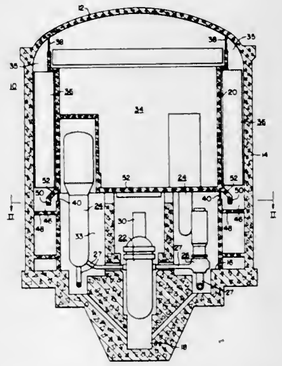


A composite lifting chain is formed with an interior, protected space for service lines such as electrical or pneumatic lines. To facilitate compact storage and winding of the composite chain, as within a limited storage space in a nuclear fuel handling machine, the composite chain is separated into first and second chains or portions which are wound on separate reeling mechanisms. Within the fuel handling machine, the composite chain may be bent and offset laterally by a chain displacement mechanism to align a grapple connected to its lower end with nuclear core elements or other devices stored therein.

3,580,805
SAFETY DEVICE FOR NUCLEAR REACTORS WITH MEANS FOR PREVENTING CONTROL ROD EJECTION
Karlheinz Handel, Bruchsal, Germany, assignor to Gesellschaft fur Keinforschung m.b.H.
Filed Nov. 7, 1967, Ser. No. 681,202
Claims priority, application Germany, Nov. 8, 1966, G 48,394
Int. Cl. G21c *7/12, 9/00*
U.S. Cl. 176—36 **5 Claims**

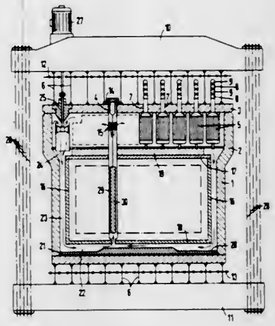
A safety device for nuclear reactors, wherein the reactor comprises a housing or containment surrounding a core having moveable control rods therein and a pressure tube extending from the housing in which the control rod and the control rod movement mechanisms are contained or to which they are attached. A safety locking device is provided within the housing proximate to the core which comprises pawl means proximate to mating-engagement means extending from the control rod, wherein the pawl is held away from the extended engagement means under tension. In the event that the pressure tube is forced away from the reactor, the means holding the pawl away from the extended engagement means is removed, whereby permitting the pawl to engage the engagement means and prevent the ejection from the core of the control rod.

3,580,806
PRESSURE SUPPRESSING ARRANGEMENT
Sterling J. Weems, Chevy Chase, and I. Harry Mandil, University Park, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Apr. 5, 1968, Ser. No. 719,054
Int. Cl. G21c *13/00*
U.S. Cl. 176—37 **5 Claims**



A nuclear steam generating plant is disclosed which is enclosed within a containment structure which employs the melting of a solid material such as ice for pressure suppression and heat absorption purposes. An annular diffuser section is situated beneath an annular solid material containing compartment to prohibit excess coolant escaping from the reactor after an accident from overloading and channeling through vertical sections of the meltable solid. The diffuser section comprises a plurality of liquid traps which act as valves, i.e., each trap fills with liquid and is essentially sealed after a rated load of escaping coolant has melted a portion of the vertical section of solid material above it to ensure the exposure of other sections of solid material to the escaping coolant.

3,580,807
STEAM GENERATING ASSEMBLY FOR USE IN THE INTERIOR OF A PRESSURE VESSEL OF A PRESSURIZED WATER NUCLEAR REACTOR
Hermann Kumpf, Dusseldorf, Eller, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany
Filed June 13, 1968, Ser. No. 736,709
Claims priority, application Germany, June 14, 1967, S 110,308
Int. Cl. G21c *15/00*
U.S. Cl. 176—55 **4 Claims**

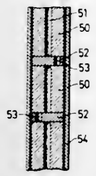


Steam generating assembly for use within a pressure vessel of a pressurized water reactor includes primary fluid channels extending vertically through and above the reactor core and formed thereabove with lateral outlets. Heat exchanger modules suspended from the top of the pressure vessel above the core and between the channels comprise an upper and a lower collection chamber and straight secondary fluid conveying elements connected therebetween and having heat transfer surfaces directly exposed to the interior of the pressure vessel for engagement by a flow of heated primary fluid in a substantially horizontal direction from the lateral outlets of the primary fluid channels.

3,580,808
NUCLEAR REACTOR FUEL ELEMENT WITH NONALIGNED CHANNELING
Enar Lofroth, Roslags-Nasby, Sweden, assignor to Aktiebolaget Atomenergi, Stockholm, Sweden
Filed Feb. 26, 1968, Ser. No. 708,308
Int. Cl. G21c *3/30*
U.S. Cl. 176—74 **1 Claim**

A known type of a nuclear reactor contains vertical fuel elements in which a vertical channel is provided in the fissile fuel. It has been found that small particles or

drops of fissile fuel collects on the bottom of said vertical channel. The inconvenience resulting from said collec-



tion of fissile fuel can be reduced if the vertical channel is divided into a plurality of shorter sections.

3,580,809
NUCLEAR REACTOR FUEL ELEMENT WITH SPACED REDUCTIONS OF DIAMETER
Albert Etheridge Williams, Poulton, and William Simpson Linkison, Blackpool, England, assignors to United Kingdom Atomic Energy Authority, London, England
Filed Mar. 28, 1968, Ser. No. 716,725
Claims priority, application Great Britain, Apr. 12, 1967, 16,875/67
Int. Cl. G21c *3/04*
U.S. Cl. 176—76 **4 Claims**

A fuel pin for a fuel element for a fast breeder nuclear reactor has diameter reductions to bring about a reduction in the cross-sectional area of fissile fuel in register with these diameter reductions, so reducing the heat rating of the volumes of fissile fuel in register with the diameter reductions and reducing the tendency of such volumes to melt in the event of a temperature excursion of the reactor. The resulting barriers to re-orientation of fuel by melting are advantageous. The application of the invention to vibrocompacted fuel and to a combination of vibrocompacted and pelleted fuel is described.

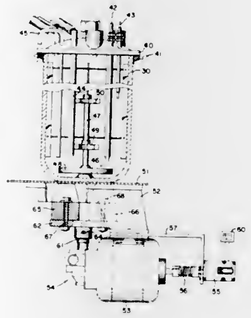
3,580,810
FERMENTATIVE PRODUCTION OF L-THREONINE
Isamu Shiio, Kamakura-shi, and Shigeru Nakamori and Kounosuke Sano, Kawasaki-shi, Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan
No Drawing. Filed July 26, 1968, Ser. No. 747,828
Claims priority, application Japan, July 28, 1967, 42/48,568
Int. Cl. C12b *1/00*
U.S. Cl. 195—29 **4 Claims**

Certain mutants of *Escherichia coli* which require isoleucine for growth and can grow in the presence of more than 1 mg./l. α-amino-β-hydroxy-valeric acid in an otherwise conventional culture medium produce L-threonine in amounts of several grams per liter of the medium.

3,580,811
SYNTHETIC FERMENTATION MEDIUM AND PROCESS USING SAME FOR CULTIVATING *GIBBERELLA ZEAE*
Phil Hidy, Terre Haute, Ind., assignor to Commercial Solvents Corporation
No Drawing. Continuation-in-part of application Ser. No. 670,455, Sept. 25, 1967. This application Apr. 16, 1968, Ser. No. 721,606
Int. Cl. C12b *3/02;* **C12d** *13/00*
U.S. Cl. 195—100 **21 Claims**

A synthetic fermentation medium, particularly for use in the production of an anabolic and estrogenic substance identified in U.S. Pat. No. 3,196,019, by cultivation of the microorganism *Gibberella zeae* (Gordon). The medium includes exfoliated vermiculite as a support for the microorganism and an aqueous nutrient production medium containing a sugar such as glucose as the carbohydrate source for the microorganism.

3,580,812
FERMENTER HAVING A MAGNETICALLY DRIVEN AGITATOR
Charles E. Bender and Douglas S. Fraser, New Paltz, N.Y., assignors to Cenco Medical/Health Supply Corporation, Chicago, Ill.
Filed Oct. 19, 1967, Ser. No. 676,419
Int. Cl. C12b *1/00*
U.S. Cl. 195—143 **4 Claims**

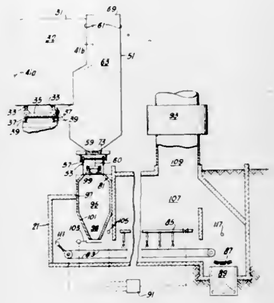


A magnetic drive arrangement for fermenters wherein the sample or culture agitated must be maintained free of contamination. The magnetic drive includes a driven plate and a driving plate. The magnets on the driven plate are polygonally arranged with like poles adjacent to maximize field strength, and are mounted in a cup-shaped receptacle, located and held by a simple spacer plate. A cover plate captivates the magnets and is joined to the cup-shaped receptacle to isolate them from the sample agitated. The rotational drive includes a double shaft motor which drives the driving plate at one end through a reduction gear drive, with the other end of the motor shaft directly coupled to a tachometer generator to provide accurate speed readings in the lower speed ranges.

3,580,813
CONDITION RESPONSIVE WATER QUENCH IN A CLOSED COKE COOLING SYSTEM
Basil W. Hinchliffe, Pittsburgh, Pa., assignor to Koppers Company, Inc.
Filed Jan. 28, 1969, Ser. No. 794,485
Int. Cl. C10b *39/12*
U.S. Cl. 201—39 **11 Claims**

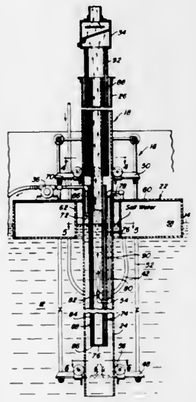
Incandescent coke is received from a coke oven through a closed coke guide into a closed hopper car; the car

travels to a closed cooling unit where the coke is dumped. In the closed unit, the coke is charged at a predetermined rate onto a conveyor which travels at a set speed. The coke on the conveyor passes through



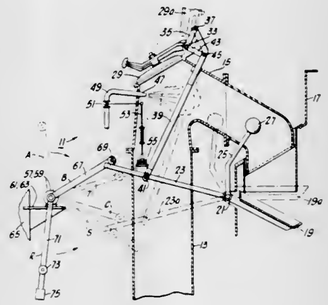
water sprays which direct water at a determined flow rate on to the coke to cool the coke to a predetermined temperature. Subsequently, the quenched coke is conveyed away for further processing.

3,580,814
FLOATING, SEA WATER DISTILLATION APPARATUS USING A RECIRCULATING, DIRECTLY CONTACTING FLUENT HEATING MEDIUM
Harry S. Green, R.R. 1, Box 22A, Wilmington, Ill. 60481
Filed Mar. 14, 1969, Ser. No. 807,253
Int. Cl. B01d *3/00*
U.S. Cl. 202—234 **6 Claims**



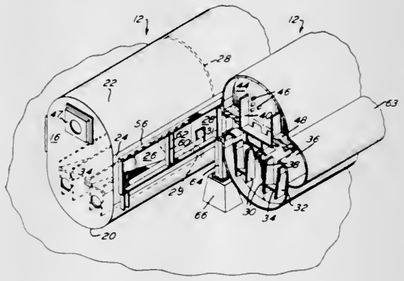
Sea water, evaporated by direct contact with heated oil discharged into an insulated heat exchange tube, mounted within the lower submerged portion of a steam stack carried by a float member for vertically guided movement in response to tidal changes in the level of the sea water relative to a stationary frame. The oil rises to the top of the water within the heat exchange tube for withdrawal by a suction intake after transfer of its heat to the water. The evaporated water rises as a vapor through the steam stack to a condenser after passing through a steam trap. A pump connected to the suction intake recirculates the oil through a heater.

3,580,815
APPARATUS FOR SIMULTANEOUSLY ACTUATING STANDPIPE LID, DAMPER VALVE AND STEAM VALVE
Linwood G. Tucker, Pittsburgh, Pa., assignor to Koppers Company
Filed Jan. 30, 1969, Ser. No. 795,185
Int. Cl. C10b *27/06*
U.S. Cl. 202—258 **5 Claims**



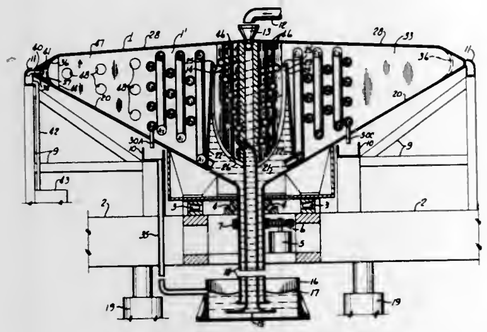
Mechanism to actuate simultaneously a standpipe lid, damper valve and steam valve includes two rotary actuators mounted to the larry car each having an arm that engages and rotates linkage to actuate the standpipe lid, damper valve and steam valve.

3,580,816
APPARATUS FOR MAKING LARGE DISTILLATION PLANTS
Robert A. Tidball, Swarthmore, Pa., William M. King, Massillon, Ohio, and Dewey R. Bosley, Boothwyn, and Charles M. Jennings, Norwood, Pa., assignors to Baldwin-Lima-Hamilton Corporation, Philadelphia, Pa.
Continuation-in-part of application Ser. No. 554,453, June 1, 1966. This application Oct. 17, 1969, Ser. No. 868,978
Int. Cl. B01d *3/06;* **C02b** *1/06*
U.S. Cl. 202—173 **3 Claims**



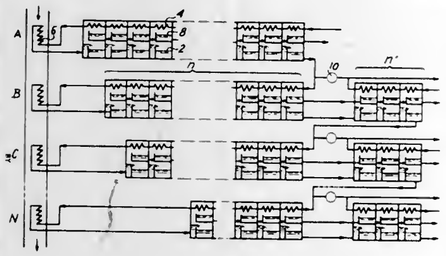
The shell of a multi-stage distilling plant, wherein preassembled sections, each containing a like series of evaporation stages, have mating openings in their respective side walls providing vapor communication between corresponding stages of sections. Peripheral edges of the openings in the sections and abutting edges of internal partitions and reinforcing members of the sections serve as joints. The joined sections provide a single large multistage plant. The method includes steps of fabricating the sections, aligning the fabricated sections, and welding the sections together to form a single large plant.

3,580,817
METHOD AND APPARATUS FOR THE CENTRIFUGAL DISTILLATION OF A LIQUID
Nicholas Joseph Schnur, 704 St. Agnes Lane, West Mifflin, Pa. 15122
Filed Feb. 25, 1969, Ser. No. 802,152
Int. Cl. B01d *3/10*
U.S. Cl. 203—11 **12 Claims**



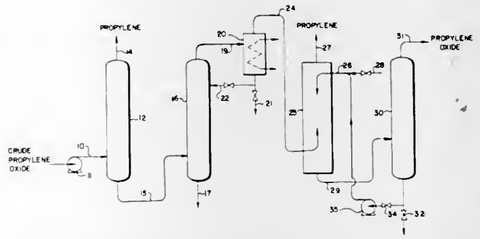
Centrifugal distillation of a liquid in a rotary sealed container maintained at a pressure substantially equal to the vapor pressure of the liquid to withdraw and cool the molecular vapor and centrifugally force it to the periphery barrier of the chamber by acceleration due to the centrifugal speed of the chamber and creating sufficient pressure on the molecular vapor to condense the same into the distilled liquid. The barrier retains the distilled liquid until a sufficient entrapped quantity is enabled to be discharged from the chamber as an additional quantity of the liquid is distilled thereby maintaining a continuous self-contained process while adding liquid by the relative pressure differential between the chamber and atmospheric pressure.

3,580,818
SEA WATER MULTISTAGE DISTILLATION PROCESS WITH COMMON REHEATING MEANS
Rocco Catoggio de Villiers, Brooklyn Pretoria, Transvaal, Republic of South Africa, and Loic Blachez, Paris, Francois Jegou, Bourg-la-Reine, and Jean Huyghe and Paul Vignet, Grenoble, France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed Mar. 11, 1969, Ser. No. 806,078
Claims priority, application France, Mar. 18, 1968, 144,284
Int. Cl. B01d *3/06*
U.S. Cl. 203—11 **5 Claims**



A method and installation for the distillation of a solution to be treated in a plurality of lines. In each line, the solution is reheated in the liquid state, then caused to expand in a series of stages at progressively decreasing pressures consisting of stages for recovery at higher pressure and stages for heat rejection at lower pressure, and the vapor produced at each stage is caused to condense. Condensation is produced at least in the recovery stages by exchange with the feed solution as this latter is circulated from one stage to the next prior to reheating and in counterflow to the reheated solution. The feed solution of each line consists of the non-vaporized brine of the preceding line as completed by a make-up quantity of fresh solution. Reheating is carried out either at temperatures which decrease progressively from one line to the next as a function of the increase in the concentration of a salt having reverse solubility in the reheated solution or at temperatures which increase progressively from one line to the next as a function of the increase in the concentration of a salt having normal solubility in the reheated solution.

3,580,819
RECOVERY OF PROPYLENE AND PROPYLENE OXIDE BY SELECTIVE SEPARATION WITH PLURAL STAGE DISTILLATION, PROPYLENE OXIDE ABSORPTION AND SUBSEQUENT DISTILLATION
Sadok E. Hoory, El Cerrito, Stanley F. Newman, San Francisco, and Robert E. Vincent, Lafayette, Calif., assignors to Shell Oil Company, New York, N.Y.
Filed Apr. 21, 1969, Ser. No. 817,721
Int. Cl. B01d *3/34;* **C07c**
U.S. Cl. 203—42 **4 Claims**



Propylene oxide and propylene are separately recovered, in a high state of purity, from a crude propylene oxide, produced by reaction of propylene with an organic hydroperoxide, and containing the propylene oxide in admixture with unconverted propylene, water and higher boiling oxygen-containing organic impurities, by subjecting the crude propylene oxide to a two stage distillation, in the first stage of which propylene is taken overhead under controlled conditions resulting in the wilfull retention of a substantial amount of the propylene in the distillation bottoms and in the second stage of which propylene oxide is taken overhead in admixture with propylene, and separating propylene oxide from the second stage distillation overhead by selective absorption in an aqueous solvent.

3,580,820
PALLADIUM-NICKEL ALLOY PLATING BATH
Katsumi Yamamura, Suwa-shi, Tsugumitsu Miyasaka, Suwa-gun, Nagano-ken, Shinichi Hayashi, Tokyo, Masao Yamamoto, Koshigaya-shi, and Yukio Matsubara, Tokyo, Japan, assignors to Kabushiki Kaisha Suwa Seikosha and Nisshin Kasai Kabushiki Kaisha
No Drawing. Filed Jan. 4, 1968, Ser. No. 695,576
Claims priority, application Japan, Jan. 11, 1967, 42/1,868
Int. Cl. C23b *5/32, 5/46*
U.S. Cl. 204—43 **5 Claims**

A palladium-nickel alloy plating bath is formed of a solution of palladium salt and a nickel salt in ammonia and a brightener in the nature of a sulfonate or a sulfonamide is added to the bath in which a metal is plated for approximately 30 minutes at a pH in the range of 7.5, temperature in the range of 30° C., and cathode current density in the range of 1 a./dm.^{2} without agitation.

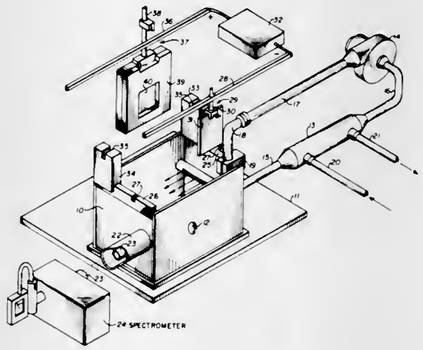
3,580,821
BRIGHT SILVER ELECTROPLATING
Hans-Gunther Todt and Wolfgang Dahms, Berlin, Germany, assignors to Schering A.G., Berlin, Germany
No Drawing. Filed June 24, 1969, Ser. No. 838,040
Claims priority, application Germany, June 27, 1968, P 17 71 699.3
Int. Cl. C23b *5/26, 5/46*
U.S. Cl. 204—46 **5 Claims**

Fully bright silver electrodeposits are obtained from otherwise conventional cyanide-type silver plating electrolytes in the presence of small amounts of acids of the formula

R—CX—NR'—NH—CS—SH

and of their soluble salts, in the formula R being lower alkoxy or NHR''; R'' being hydrogen, lower alkyl, phenyl, halophenyl, lower alkyl phenyl, or lower alkoxy phenyl; R' being hydrogen or lower alkyl; and X being oxygen, sulfur, or imino, but R being different from amino when X is sulfur.

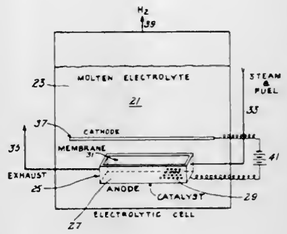
3,580,822
METHOD FOR PRODUCING A CHROMIUM ACTIVATED ALUMINUM OXIDE SCINTILLATOR
Robert W. Allison, Jr., Richmond, Robert W. Brokloff, Vallejo, and John R. Woodyard, Berkeley, Calif., assignors to the United States of America as represented by the United States Atomic Energy Commission
Filed July 7, 1969, Ser. No. 839,510
Int. Cl. C23b *9/02*
U.S. Cl. 204—58 **7 Claims**



A radiation resistant chromium activated aluminum oxide scintillator produced by immersing an aluminum anode and lead cathode in an anodic bath and gradually increasing an applied potential until bright flashes or "anodic scintillation" occurs whereby Cr ions from the solution are injected into the Al_2O_3 base lattice. The scintillators produced by this process may be readily utilized to visually aid in the control and transport of high intensity beams without radiation damage thereto.

3,580,823
HYDROGEN PRODUCTION
Harold Shalit, Drexel Hill, Pa., assignor to Atlantic Richfield Company, Philadelphia, Pa.
Filed Mar. 17, 1969, Ser. No. 807,864
Int. Cl. B01k *1/00*
U.S. Cl. 204—60 **7 Claims**

An improved process and apparatus for the production of hydrogen of high purity whereby a carbonaceous fuel is reformed to produce hydrogen and said hydrogen is recovered economically from said reforming operation through the use of an electrolytic process using chemical



energy of the reforming process to reduce electrical energy needed and in a molten electrolyte environment.

3,580,824
IMPREGNATED GRAPHITE
John E. Currey, Morris P. Grotheer, and Edward H. Cook, Jr., Lewiston, N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.
No Drawing. Filed Dec. 31, 1968, Ser. No. 789,008
Int. Cl. B01k *1/00;* **C01b** *11/26*
U.S. Cl. 204—95 **11 Claims**

Graphite impregnated with iron in an amount between about 0.05 to about 3 percent by weight affords an excellent electrode material for the electrolysis of alkali metal halides. Electrode over voltage is decreased and electrode life is prolonged by iron deposition in comparison to conventional graphite electrodes.

3,580,825
ELECTROLYTIC PROCESS FOR PURIFYING IRON DISSOLVED FROM SCRAP STEEL
Stanley Hills, Cherry Hill, N.J., assignor to ESB Incorporated
No Drawing. Filed Oct. 28, 1968, Ser. No. 771,319
Int. Cl. C22d *1/24*
U.S. Cl. 204—112 **4 Claims**

Iron sufficiently free of manganese impurities to be useful as active material in electrochemical cells is obtained in a continuous process by dissolving scrap steel containing an unacceptably high manganese content and subsequently plating out the iron but not much of the manganese. The pH of the electrolytic bath is maintained so the H_2 evolution will occur after iron deposition but before manganese deposition. The preferred conditions for the electrolytic bath are: a pH range from about 2.5 to about 3.0; a current density range from about 0.1 to about 0.25 amp/sq. in.; a ferrous ion concentration range from about 25 to about 40 gr./l.; and a supporting electrolyte concentration range from about ½ to about 1 mole/1.

3,580,826
ELECTROLYTIC DECOLORING OF FERTILIZER SOLUTIONS
Donald L. Whitfill, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
No Drawing. Filed Feb. 24, 1969, Ser. No. 801,829
Int. Cl. B01k *1/00*
U.S. Cl. 204—131 **8 Claims**

Oxidizable impurities in fertilizer solutions are removed by addition of a soluble chloride followed by in situ electrochemical generation of chlorine.

3,580,827

ETCHING METHOD AND APPARATUS

Jean-Paul Lannegrace, Neuilly-sur-Seine, France, assignor to Imprimerie Chaix-Desfosses-Neorgravure, Paris, France

Filed July 23, 1968, Ser. No. 746,915

Claims priority, application France, July 27, 1967, 115,993

Int. Cl. B23p *1/00*

U.S. Cl. 204—143 **2 Claims**

To etch an electrically conducting metal surface, this surface is attacked with a liquid mordant through a photographically treated resist which is semi-permeable to the mordant, while varying the composition of the mordant such that the etching rate tends to lag slightly behind the ideal theoretical rate, this lag being compensated by applying to the surface a positive electrical potential with respect to the mordant.

3,580,828

ELECTRODEPOSITION OF LITHIUM

Thomas Bradley Reddy, Pound Ridge, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

No Drawing. Filed Dec. 16, 1968, Ser. No. 784,202

Int. Cl. C23b *5/00*

U.S. Cl. 204—14 **9 Claims**

Cohesive, dense deposits of lithium having a specular appearance are obtained by electrodeposition from anhydrous electrolyte of lithium salt in organic solvent. Electrolyte concentration is 0.05 to 0.20 mole lithium salt per liter and current density is 0.05 to 0.25 milliampere per square centimeter.

3,580,829

PROCESS FOR IRRADIATING POLYVINYLIDENE FLUORIDE AND A COMPATIBLE POLYFUNCTIONAL MONOMER AND PRODUCT THEREOF

Vincent L. Lanza, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

No Drawing. Continuation-in-part of applications Ser. No. 257,763, Feb. 11, 1963, and Ser. No. 403,328, Oct. 12, 1964. This application Mar. 1, 1968, Ser. No. 709,804

Int. Cl. C08d *1/00;* **C08f** *15/00, 19/00*

U.S. Cl. 204—159.17 **24 Claims**

A composition comprising polyvinylidene fluoride and a compatible polyfunctional monomer may be treated with low doses of irradiation to provide a crosslinked polyvinylidene fluoride having excellent strength properties, resistance to heat aging and the property of elastic memory.

3,580,830

PREPARATION OF XANTHATE TERMINATED POLYMERS

Alan R. Siebert, Maple Heights, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

No Drawing. Filed Sept. 5, 1968, Ser. No. 757,785

Int. Cl. C08d *1/00;* **C08f** *1/16*

U.S. Cl. 204—159.24 **2 Claims**

Xanthate terminated polyesters are known intermediates in the preparation of mercaptan terminated olefin polymers and copolymers. An improved process for the preparation of these intermediates involves the reaction of olefin monomer(s) with a xanthogen disulfide in the presence of a particular range of high energy radiation. The disulfide acts both as a source of free radicals and also as a polymerization modifier.

3,580,831

PHOTOCHLORINATION OF MONO- AND DI-CHLOROETHANE

Michael J. Mintz, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Jan. 13, 1969, Ser. No. 790,848

Int. Cl. B01j *1/10;* **C07c** *17/00*

U.S. Cl. 204—163 **4 Claims**

In the process for preparing compounds of the formula CH_3CCl_2X, wherein X is H or Cl, said process comprising reacting by contacting in the liquid phase, at a temperature of 0 to 50° C. in the presence of actinic light, a compound of the formula CH_3CHClX, wherein X is H or Cl, with Cl_2, the improvement of carrying out said reaction in the presence of a catalytic amount of I_2.

3,580,832

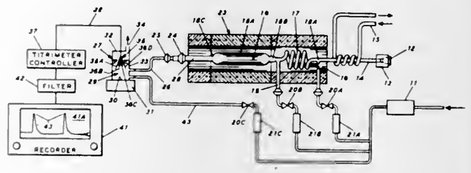
ELECTROLYTIC COULOMETER TITRATION SYSTEM

David R. Rhodes, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 13, 1968, Ser. No. 705,179

Int. Cl. G01n *27/44*

U.S. Cl. 204—195 **2 Claims**



The presence and concentration of a constituent within either a continuous or discontinuous flowing sample, is determined by means of a coulometer titration system including (i) a titration cell containing hydrogen saturated electrolyte, subject to pressure variations, for absorbing the constituent, or a quantitatively related component thereof, to thereby change the hydrogen ion concentration (pH) of the electrolyte from a predetermined pH set point level, (ii) potential developing electrodes disposed in the electrolyte for sensing said change in hydrogen ion concentration from said set point level by means of a voltage produced therebetween, (iii) a pair of generating electrodes for electrolytically producing, in the electrolyte, in response to said voltage just enough of a component reactable with the constituent being analyzed for, or component thereof, to neutralize the constituent or component thereof, to return said hydrogen ion concentration to its predetermined set point level, and (iv) recording means maintaining a continuous record of the component reactable with the said constituent, or component thereof, so as to indicate the presence and concentration thereof within the titration cell. The present invention contemplates the use of first and second potential electrodes including an improved hydrogen-dissolved-in-palladium sensing electrode adapted, in combination, with a reference electrode to extend the response range of the system to detect low concentrations of the constituent being analyzed for, or component thereof, by dampening the rate of change, with time, of a potential developed between the improved sensing electrode and the reference electrode due to changes in hydrogen partial pressure at the surface of the improved sensing electrode. Preferably, the improved sensing electrode has a hydrogen-palladium (H/Pd) atomic ratio greater than 0.03 and up to and including about .60.

3,580,833

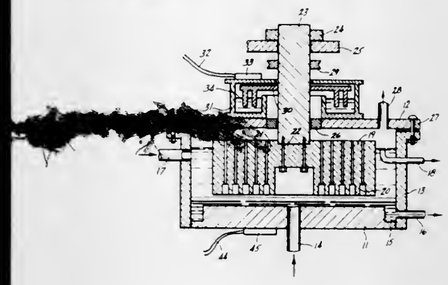
MERCURY CELL HAVING ROTATING ANODE

Roy M. Cooper, Groton, Conn., assignor to Olin Mathieson Chemical Corporation

Filed Apr. 30, 1969, Ser. No. 820,459

Int. Cl. C23b *5/68;* **C01d** *1/08*

U.S. Cl. 204—212 **8 Claims**



A new rotary anode, mercury cathode electrolytic cell for the manufacture of chlorine and caustic alkalies from aqueous alkali metal chloride brines provides the advantages of high current density, high current efficiency, low floor space and low cost per ton of product.

3,580,834

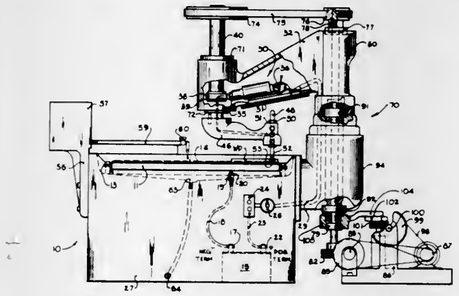
APPARATUS FOR MACHINING METALS ELECTROCHEMICALLY

Robert K. Sedgwick, Waukesha, Wis., assignor to Kearney & Trecker Corporation, West Allis, Wis.

Filed Dec. 4, 1967, Ser. No. 687,776

Int. Cl. B23p *1/02*

U.S. Cl. 204—224 **3 Claims**



An apparatus for the electrochemical machining of flat metal surfaces which utilizes a pool of viscous electrolyte of sufficient viscosity to support a workpiece and space the workpiece very slightly from the surface plate, as well as to facilitate movement of the workpiece over the surface plate. Movement of the workpiece in combination with various viscosities of the viscous electrolyte are utilized to obtain the degree of flatness desired.

3,580,835

ELECTROLYTIC REDUCTION CELL

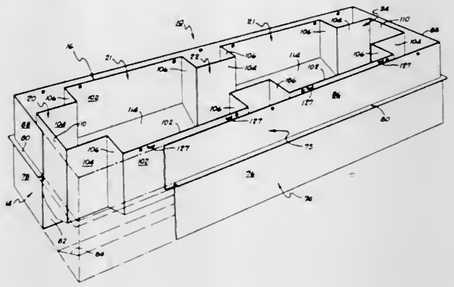
John R. Peterson, Oakland, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Feb. 24, 1969, Ser. No. 801,454

Int. Cl. C22d *3/02, 3/08*

U.S. Cl. 204—243 **23 Claims**

Improved electrolytic reduction cell for producing molten magnesium metal and the like and made up of uniquely and removably arranged outer and inner shells having a mass of thermally resistant material interposed therebetween and wherein the interior of the cell is divided in an improved fashion into feed and electrolytic chambers.



3,580,836

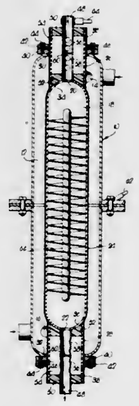
TREATMENT SYSTEM WITH COOLING MEANS

Arthur S. King, 1710 Baltimore, Prairie Village, Kans. 64105

Continuation-in-part of application Ser. No. 727,835, May 9, 1968. This application Apr. 8, 1969, Ser. No. 814,279

Int. Cl. B01d *13/02*

U.S. Cl. 204—308 **12 Claims**



A fluid is subjected to an electrostatic field between an inner and an outer electrode. By use of a cooling system through the inner electrode, a dielectric on the inner electrode is protected against the delectrious effects of the treated fluid when the latter is heated.

3,580,837

HYDROREFINING OF COKE-FORMING HYDROCARBON DISTILLATES

Ernest L. Pollitzer, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

No Drawing. Filed Apr. 7, 1969, Ser. No. 814,173

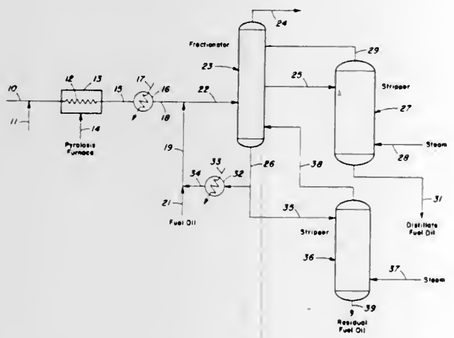
Int. Cl. C10g *23/00*

U.S. Cl. 208—57 **7 Claims**

A process for hydrorefining sulfurous hydrocarbon distillates containing mono-olefinic, di-olefinic and aromat-

ic hydrocarbons. Through the use of particular catalytic composites containing metallic components from Group VII–B, having an atomic number greater than 25, and the noble metals of Group VIII, increased selectivity and stability of operation is attained. The selectivity is most noticeable with respect to the retention of aromatics, and in hydrogenating conjugated di-olefinic and mono-olefinic hydrocarbons.

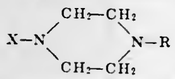
3,580,838
HYDROCARBON PYROLYSIS PROCESS
Irvin H. Lutz, Dallas, Tex., assignor to The Lummus Company, Bloomfield, N.J.
Filed Feb. 24, 1969, Ser. No. 801,649
Int. Cl. C10g *9/14, 9/16*
U.S. Cl. 208—100 **8 Claims**



Improved process for cracking a hydrocarbon feed in a pyrolysis furnace wherein the sensible heat of the effluent is employed to fractionate a fuel oil into a distillate and residual fraction. A fuel oil is added to the pyrolysis effluent, along with recovered quench oil, to effect quenching thereof and the mixture introduced into a gasoline fractionator to recover a distillate sidestream. The distillate sidestream, containing distillate fractions from both the effluent and residual fuel, may be employed to meet fuel requirements for the pyrolysis furnace. In addition, the residual recovered as fractionator bottoms is employed to provide quench oil and meet other fuel requirements for the pyrolysis plant or an extraneous operation.

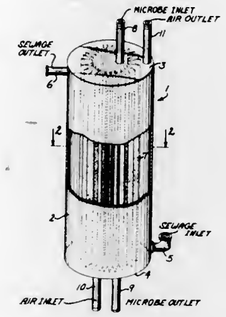
3,580,839
RECOVERY OF AROMATIC HYDROCARBONS FROM MIXTURES OF HYDROCARBONS BY SELECTIVE EXTRACTION WITH A SUBSTITUTED PIPERAZINE SOLVENT
Ernst Fuerst, Neustadt, and Hans-Martin Weitz, Frankenthal, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
No Drawing. Filed Dec. 19, 1968, Ser. No. 785,368
Claims priority, application Germany, Dec. 30, 1967, P 16 45 709.3
Int. Cl. C10g *21/20*
U.S. Cl. 208—326 **8 Claims**

Recovery of aromatic hydrocarbons from mixtures of hydrocarbons which contain paraffins and possibly olefins and/or naphthenes by using as extractants piperazine derivatives having the general formula:



where X denotes formyl or acetyl and R denotes lower alkyl.

3,580,840
PROCESS FOR TREATING SEWAGE AND OTHER CONTAMINATED WATERS
Joseph E. Uridil, St. Paul, Minn., assignor to Litton Systems, Inc., Beverly Hills, Calif.
Filed Mar. 18, 1969, Ser. No. 808,267
Int. Cl. C02c *1/02*
U.S. Cl. 210—11 **9 Claims**



Sewage and other chemically impure waters are made cleaner by a process which involves the removal or extraction from the water of various contaminants by the controlled growth of selected microorganisms using the sewage or other impure water as the basic growth substrate. The microorganisms (both as the inoculant and as the growth product) are isolated from the sewage or other contaminated water by means of a porous membrane or barrier of restricted pore size (e.g. 0.8–2 microns). These pores are large enough to permit molecules of the contaminants to pass through or penetrate the porous barrier to thereby contact and be acted upon or assimilated by the microorganisms. These pores are small enough to prevent the large scale escape or mass migration of the microorganisms through the membrane into the contaminated water. As a result of the process, one or more contaminants in the waste water are consumed in the microbial metabolism or growth process, thereby making the water cleaner.

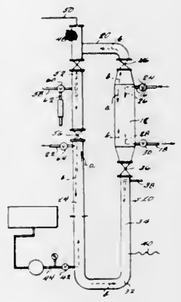
3,580,841
ULTRATHIN SEMIPERMEABLE MEMBRANE
John E. Cadotte, Roseville, and Peter S. Francis, Edina, Minn., assignors to the United States of America as represented by the Secretary of the Interior
No Drawing. Original application Jan. 31, 1967, Ser. No. 613,054. Divided and this application July 31, 1969, Ser. No. 856,516
Int. Cl. B01d *13/00, 31/00*
U.S. Cl. 210—23 **17 Claims**

An ultrathin semipermeable reverse osmosis membrane which may be made by casting a concentrated polymer solution on a liquid surface and then evaporating, and which may be laminated with a separate porous support membrane to form a composite reverse osmosis membrane. A process of separating solvent from solution by reverse osmosis comprising bringing that solution into contact with a membrane comprising a semipermeable ultrathin membrane at a pressure above the osmotic pressure.

3,580,842
DOWNFLOW ION EXCHANGE
Irwin R. Higgins, Oak Ridge, Tenn., assignor to Chemical Separation Corporation, Oak Ridge, Tenn.
Filed Apr. 8, 1968, Ser. No. 719,389
Int. Cl. B01d *15/02, 15/06;* **C02b** *1/16*
U.S. Cl. 210—25 **11 Claims**

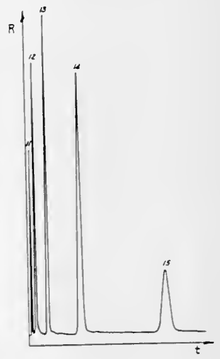
A continuous cyclic process for countercurrent contact of a contaminant containing liquid with a solid in a

column loop which includes introducing the contaminant containing liquid into the upper portion of one section of the column loop for downward flow through the solids bed therein to transfer or load the contaminant onto the solids. The section is positioned adjacent the upper end of the column loop. Liquid with a reduced amount of



contaminant is withdrawn from the lower portion of this section. A regenerating agent is fed to the lower portion of another section of the column loop for flow through a bed of solids loaded with the contaminant. The flow of liquid and regenerating agent are interrupted and the solids bed is shifted around the loop and the loading and regenerating cycles are then repeated.

3,580,843
CHROMATOGRAPHIC MEDIUM AND METHOD
Ival O. Salyer, Dayton, Robert T. Jefferson, West Carrollton, and William D. Ross, Eaton, Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.
Filed July 27, 1970, Ser. No. 58,382
Int. Cl. B01d *15/08*
U.S. Cl. 210—31 **13 Claims**



An improvement in a chromatographic column in which the chromatographic medium or support is an open-pore polyurethane structure filling the column wall-to-wall; the process for filling the column with a homogeneous precursor solution; and the process for using the column to separate organic compounds such as hydrocarbons and metal derivatives of diketones.

3,580,844
METHOD OF PROCESSING OIL EMULSIONS USED IN METAL MACHINING
Helmut Fratzscher, Gross-Auheim, Kurt Klein, Langen, Hessen, Joachim Maluzi, Gross-Auheim, and Peter Hansen and Werner Schmitz, Wolfgang B. Hanau am Main, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany
No Drawing. Continuation-in-part of application Ser. No. 654,990, July 21, 1967. This application Nov. 4, 1969, Ser. No. 874,035
Claims priority, application Germany, July 22, 1966, D 50,648; Jan. 19, 1967, D 52,051
Int. Cl. B01d *15/00*
U.S. Cl. 210—40 **3 Claims**

Aqueous oil emulsions used in metal machining are separated into an aqueous phase and an oily phase by adding a mixture of a formate or acetate of an alkaline earth metal, earth metal, cadmium or zinc to the emulsion to break the emulsion with a finely divided absorbent and adsorb the separating oil, thereby converting the oil to a filterable form and filtering it off.

3,580,845
ACID CONTAINING ELECTROLYTIC LIQUID FOR AN ELECTROLYTIC CAPACITOR
Hildegard Dahle, Herborn, Germany, assignor to U.S. Philips Corporation, New York, N.Y.
No Drawing. Filed Aug. 22, 1969, Ser. No. 852,449
Claims priority, application Germany, Aug. 22, 1968, P 17 64 869.0
Int. Cl. H01g *9/00*
U.S. Cl. 252—62.2 **4 Claims**

The invention relates to a low-resistive electrolyte liquid for an electrolytic capacitor which liquid consists of a mixture of a multivalent alcohol in water as a solvent, a basic nitrogen compound, two inorganic acids and one organic acid and/or reaction products of these acids or of the nitrogen compound.

3,580,846
FERROELECTRIC CERAMIC MATERIALS
Chiyoshi Okuyama, 2–14 Nishiki-cho, and Syuzo Osumi, 1–15 Hikari-cho, both of Fujinomiya-shi, Shizuoka-ken, Japan
Filed Nov. 10, 1969, Ser. No. 875,368
Int. Cl. C04b *35/46, 35/48*
U.S. Cl. 252—62.9 **4 Claims**

Ferroelectric ceramic materials having essentially the composition $Pb(Zr\text{-}Ti)O_3$ or $Pb(Zr\text{-}Ti\text{-}Sn)O_3$ and containing Bi and Nb in small percentage exhibit improved coupling coefficients. As modifications, the materials may also contain Mn in small percentage and part of the Pb may be replaced by Ba, Sr or both. The materials are particularly useful as ceramic wave filters and piezoelectric voltage sources.

ERRATUM

For Class 252—71 see:
Patent No. 3,580,759

3,580,847
HYDRAULIC FLUID
Matthew A. Boehmer, Allen Park, and Jerrold F. Maxwell, Trenton, Mich. (both % Wyandotte Chemicals Corp., Wyndotte, Mich. 48192)
No Drawing. Filed June 16, 1967, Ser. No. 646,498
Int. Cl. C09k *3/00*
U.S. Cl. 252—75 **7 Claims**

A two-phase hydraulic fluid composition which comprises (A) a conventional aqueous hydraulic fluid base as a first phase and (B) a liquid having a specific gravity less than that of the aqueous hydraulic fluid base (A) as

a second phase which liquid (B) is immiscible with base (A) and forms a supernatant layer floating on the surface of the aqueous base (A).

3,580,848

FUNCTIONAL FLUIDS CONTAINING CARBON DIOXIDE FOR PREVENTING CAVITATION DAMAGE

Neal W. Furby, Berkeley, Douglas Godfrey, San Rafael, and Robert L. Peeler, Albany, Calif., assignors to Chveron Research Company, San Francisco, Calif.

No Drawing. Filed Dec. 18, 1967, Ser. No. 691,150
Int. Cl. C09k *3/00;* **C10m** *3/40;* **C23f** *11/18*
U.S. Cl. 252—78 **8 Claims**

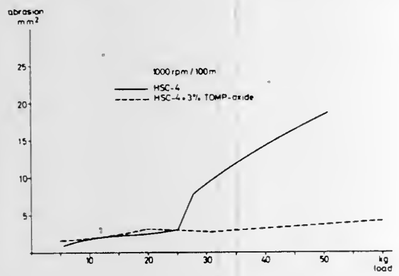
Functional fluid containing a minor amount of carbon dioxide as a cavitation damage-inhibiting additive.

3,580,849

LUBRICANT

Peter Geymayer and Siegfried Billenstein, Burgkirchen (Alz), and Werner Renz, Burghausen, Salzach, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Sept. 2, 1969, Ser. No. 854,599
Claims priority, application Germany, Sept. 5, 1968, P 17 94 094.2
Int. Cl. C09k *3/00;* **C10m** *3/42;* **C07f** *9/50*
U.S. Cl. 252—78 **2 Claims**



Lubricants are described for hydraulic fluids which do not consist of mineral oil and contain minor or major proportions of water. Such lubricants are compounds corresponding to the general formula

$$\left[H-\left(OCH_2-\overset{\overset{R}{|}}{\underset{\underset{H}{|}}{C}}\right)_n-OCH_2- \right]_1 P=X$$

in which X stands for S or O, R is CH_3 or H and n has the meaning 0–5/3. The compounds are, thus, tris-(hydroxymethyl)-phosphine oxide or sulfide and the oxalkylation products thereof which contain up to 5 ethylene oxide or propylene oxide units per molecule. Practically technical grade oxalkyllation products are used which contain an average of 0 to 5 moles of alkylene oxide per mole, and consequently n may stand for any value within the defined limits.

3,580,850

STABILIZED NONIONIC SURFACTANTS IN SOLID FORMULATIONS CONTAINING ACTIVE CHLORINE COMPOUNDS

Jean Dupre, Levittown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Filed July 17, 1967, Ser. No. 653,674
Int. Cl. C11d *7/56*
U.S. Cl. 252—99 **2 Claims**

A solid built detergent formulation consisting of a low foaming nonionic surfactant containing a minor amount of an antioxidant, an active chlorine agent, and an alkaline builder, the antioxidant serving to stabilize the surfactant against degradation caused by the oxidative or other aggressive effects of the chlorine.

3,580,851

STABLE ALKALI CHLORITE MIXTURES

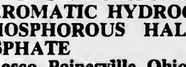
Christian Heid and Karl-Heinz Keil, Frankfurt am Main-Fechenheim, Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Frankfurt am Main-Fechenheim, Germany

No Drawing. Filed July 29, 1969, Ser. No. 845,883
Claims priority, application Switzerland, Aug. 6, 1968, 11,744/68
Int. Cl. D06l *3/06*
U.S. Cl. 252—99 **6 Claims**

Stable aqueous mixtures of alkali chlorite containing a compound of the formula

$$R-O-(CH_3-CH_2-O)_x-CH_2-CH_2-O-(CH_2)_y-\overset{\overset{R_1}{|}}{C}H-COOH$$

or alkali metal salts thereof wherein R is $-C_nH_{2n+1}$ or



n is 6 to 18;
x is 6 to 30;
y is 0 or 1; and
R_1 is hydrogen or methyl.

3,580,852

DETERGENT FORMULATIONS CONTAINING TETRAHYDROFURAN 2,3,4,5 - TETRACARBOXYLIC ACID SALTS AS BUILDERS

Meiling T. Yang, Baton Rouge, La., assignor to Ethyl Corporation, New York, N.Y.

No Drawing. Filed May 19, 1969, Ser. No. 825,983
Int. Cl. C11d *3/20, 7/26*
U.S. Cl. 252—135 **10 Claims**

To obviate eutrophication of water, non-phosphorus detergent builders are provided. These are the water-soluble salts of tetrahydrofuran 2,3,4,5-tetracarboxylic acid (e.g., the tetrasodium salt thereof). Conventional detergent actives may be used with these builders.

3,580,853

DETERGENT COMPOSITIONS CONTAINING PARTICLE DEPOSITION ENHANCING AGENTS

John J. Parran, Jr., Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

No Drawing. Filed Sept. 27, 1967, Ser. No. 671,117
Int. Cl. C11d *3/22, 3/48*
U.S. Cl. 252—152 **10 Claims**

Detergent compositions containing water-insoluble particulate substances, such as antimicrobial agents, and certain cationic polymers which serve to enhance the deposition and retention of such particulate substances on surfaces washed with the detergent composition.

3,580,854

SEQUESTERING AGENTS FOR METAL ION CONTAMINATION IN SIDE-CHAIN HALOGENATION OF ALKYL-AROMATIC HYDROCARBONS COMPRISING PHOSPHOROUS HALIDE AND ORGANIC PHOSPHATE

Ralph H. Lasco, Painesville, Ohio, assignor to Diamond Alkali Company, Cleveland, Ohio

No Drawing. Filed June 29, 1966, Ser. No. 561,340
Int. Cl. B01j *1/10;* **C07c** *17/14, 25/14*
U.S. Cl. 252—181 **1 Claim**

Metal ion contaminated, alkyl-aromatic hydrocarbons such as p-xylene contaminated with a trace amount of iron, are successfully side-chain halogenated by employing during halogenation a synergistic mixture of sequestering agent for such contamination. This mixture contains a phosphorus halide plus an organic phosphate. Even visibly contaminated hydrocarbons can be successfully side-chain halogenated. The organic phosphate is provided by an aryl phosphate, an alkyl phosphate, or their mixtures.

3,580,855

PROCESS FOR INHIBITION OF SCALE AND CORROSION USING A POLYFUNCTIONAL PHOSPHATED POLYOL ESTER HAVING AT LEAST 75% PRIMARY PHOSPHATE ESTER GROUPS

James C. Mickus, Bloomington, Minn., David B. Fordyce, Moorestown, N.J., and Richard C. Mansfield, Warminster, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

No Drawing. Continuation-in-part of application Ser. No. 576,252, Aug. 31, 1966. This application Apr. 9, 1969, Ser. No. 814,818
Int. Cl. C02b *5/06;* **C07f** *9/08*
U.S. Cl. 252—181 **6 Claims**

The invention is concerned with methods for maintaining an effective corrosion-inhibiting environment in aqueous systems, for preventing precipitation of Fe(II) from such systems, and for dispersing water-insoluble solids in aqueous suspension, said methods involving the treatment of the water systems with small amounts of a specific polyfunctional phosphated polyol ester characterized in that the ester has at least about 75% primary phosphate ester groups.

3,580,856

GETTER COMPOSITION FOR ELECTRIC LAMPS AND SIMILAR DEVICES

Edward G. Zubler, Chagrin Falls, Ohio, assignor to General Electric Company

Filed May 22, 1969, Ser. No. 826,888
Int. Cl. H01j *7/18;* **H01k** *1/56*
U.S. Cl. 252—181.6 **2 Claims**

The rate and extent (to about 100%) of thermal decomposition of P_3N_5 getter are increased by providing a catalyzer metal in contact with the solid P_3N_5 or its primary gaseous decomposition products.

3,580,857

STABLE LIQUID DICARBOXYLIC ACID ANHYDRIDE COMPOSITION

Chao-Shing Cheng, Williamsville, and Francis E. Evans, Hamburg, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Feb. 8, 1968, Ser. No. 703,866
Int. Cl. C07c *63/00;* **C08f** *45/60*
U.S. Cl. 252—182 **20 Claims**

Production of stable liquid organic carboxylic anhydrides by adding to an unstable liquid anhydride a freeze-thaw stabilizing amount of an organic isocyanate or carbodimide; if desired, the resultant liquid anhydride may be purified by subjecting the same to distillation to recover, as distillate, a pure anhydride which may be stored for extended periods without deposition of solids.

3,580,858

STABLE LIQUID ANHYDRIDE COMPOSITIONS

Francis E. Evans, Hamburg, and Chao-Shing Cheng, Williamsville, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed Feb. 8, 1968, Ser. No. 703,902
Int. Cl. C07c *63/00;* **C08f** *45/58*
U.S. Cl. 252—182 **17 Claims**

Novel liquid cyclic polycarboxylic acid anhydride mixtures which are stabilized against deposition of solids by incorporation of a small amount of at least one polyether polyol of more than 12 carbon atoms.

3,580,859

ACTIVE MATERIAL FOR LASERS

Igor Mikhailovich Buzhinsky, Pervomaiskaya ul. 5, kv. 46, Moskovskaya Obl., Lytkarino, U.S.S.R.; and Mark Efremovich Zhabotinsky, Pogodinskaya ul. 2/3, kv. 53; Jury Petrovich Rudnitsky, Babushkin, Troitsky per. 43, kv. 65; Vadim Vasilievich Tsapkin and Irma Vyacheslavovna Tsapkina, both of Tatarskaya ul. 9-a, kv. 13; and Georgy Vladimirovich Ellert, Ul. Garibaldi 19, korp. 2, kv. 53, all of Moscow, U.S.S.R.

Filed Dec. 20, 1967, Ser. No. 692,179
Int. Cl. C09k *1/04;* **C03c** *3/28*
U.S. Cl. 252—301.1 **5 Claims**

Laser glasses consisting of 30–90 wt. percent of P_2O_5; 2–40 wt. percent of each of Na_2O and Li_2O; 1–6 wt. percent Nd_2O_3 and additives of aluminum oxides or halides, halides of tin and ions of Cu, Mn, Cr, U and Ag; the total amount of said additives being not more than 20 wt. percent.

3,580,860

INFRARED-EXCITABLE ALKALINE EARTH THORIUM FLUORIDE LUMINESCENT MATERIALS

James F. Sarver, Lyndhurst, and Ralph A. Hewes, Cleveland Heights, Ohio, assignors to General Electric Company

Filed May 2, 1969, Ser. No. 831,807
Int. Cl. C09k *1/06*
U.S. Cl. 252—301.1 **13 Claims**

The invention relates to alkaline earth thorium fluoride materials activated with ytterbium and erbium. The materials respond to infrared excitation and produce visible light.

3,580,861

METHOD OF PREPARING RARE-EARTH METAL ORTHOVANADATE PHOSPHORS BY PRECIPITATION

Richard C. Ropp, Warren, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

No Drawing. Filed Mar. 18, 1969, Ser. No. 808,320
Int. Cl. C09k *1/44*
U.S. Cl. 252—301.4R **13 Claims**

An improved method of precipitating rare-earth metal orthovanadate phosphor from aqueous solution. The constituents are dissolved in acid solution, with vanadium pentoxide being dissolved in hydrochloric acid to provide a high concentration of vanadyl radical in solution. Predetermined amounts of ammonium hydroxide and hydrogen peroxide are admixed with the rare-earth metal and vanadium containing acid solutions so that the pH of the resulting mixture is determined to provide a condition under which rare-earth metal orthovanadate is very efficiently precipitated. The precipitant is calcined to provide an activated, efficient rare-earth metal orthovanadate phosphor.

3,580,862

CONTINUOUS PROCESS FOR PREPARING ALKALI METAL DISPERSIONS AND APPARATUS

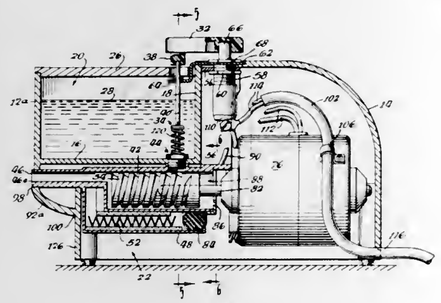
Lloyd M. Watson and William R. Birchall, Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of application Ser. No. 302,038, Aug. 14, 1963. This application Aug. 18, 1967, Ser. No. 667,023
Int. Cl. B01j *13/00*
U.S. Cl. 252—309 **12 Claims**

A process for preparing continuously a dispersion in an inert organic diluent of a finely-divided alkali metal, such as sodium, substantially uniform in particle size and alkali metal concentration is provided wherein a molten alkali metal is dispersed in an inert organic diluent with a dispersing aid which is soluble in the inert diluent, and if necessary, a stabilizing agent, by subjecting the molten alkali metal to high shear forces, and forming alkali metal

particles less than and greater than a predetermined median. The coarse particles of molten alkali metal at or above the median size are allowed to settle out, and the supernatant fine particles of molten alkali metal at or below the median size are drawn off. The coarse particles are continuously returned to the zone of high shear to further reduce their size, and alkali metal is continuously added to the zone, while the dispersion of fine particles of alkali metal having a size at or below the median, and substantially uniform in alkali metal concentration is continuously withdrawn.

3,580,863
LATHER MACHINE
Albert B. Campbell, Glenn Ellyn, Ill., assignor to Royal Products Company, Bensenville, Ill.
Continuation-in-part af application Ser. No. 729,577, May 16, 1968. This application Aug. 22, 1968, Ser. No. 755,520
Int. Cl. B01f *7/08*
U.S. Cl. 252—359 **9 Claims**



A compact, parallel, direct delivery type lather machine having a one-piece housing with compartments for a liquid soap reservoir and the lather forming components. The machine includes a lather guard having a first portion flush with the lower edge of the lather outlet, and a convex, extension-like portion depending below and on each side of the lather outlet to keep the operator's hand from blocking the outlet. An improved liquid soap valve has an O-ring seal readily replaceable by snapping the O-ring on the end of the valve stem. An improved one-piece frame member for lather machines which includes a heating chamber surrounding the whipping chamber, a liquid soap inlet at one end of the member, a lather outlet at the other end of the member, and the heating chamber being sealed at the liquid soap inlet end of the member with the other end of the heating chamber being open for insertion of the heating elements.

ERRATUM

For Class 252—389 see:
Patent No. 3,580,934

3,580,864
CHOLESTERIC-PHASE LIQUID-CRYSTAL COMPOSITIONS STABILIZED AGAINST TRUE-SOLID FORMATION, USING CHOLESTERYL ERUCYL CARBONATE
Newton N. Goldberg, Pittsburgh, Pa., and James L. Fergason, Kent, Ohio, assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
No Drawing. Filed Apr. 30, 1969, Ser. No. 820,658
Int. Cl. C07c *69/76;* **C09k** *3/04*
U.S. Cl. 252—408 **8 Claims**

Stability of cholesteric-phase liquid-crystal compositions is improved by inocorporating therein an amount, up to 100%, of cholesteryl erucyl carbonate, a novel compound, made by reaction of cholesteryl chloroformate with erucyl alcohol and pyridine. The novel carbonate does not crytallize to true solid in several months, whereas most other liquid-crystal compositions transform to true solid within several hours to several days. Moreover, the novel carbonate does itelf exibit a color play, so that it may be used in very large amounts in cholesteric-phase liquid-crystal compositions, without decreasing the vividness of the color changes exhibited thereby.

3,580,865
STABILIZATION OF CHOLESTERIC-PHASE LIQUID CRYSTAL COMPOSITIONS AGAINST TRUE SOLID FORMATION, USING CHOLESTERYL p-NONYLPHENYL CARBONATE
Newton N. Goldberg, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
No Drawing. Filed Apr. 30, 1969, Ser. No. 820,659
Int. Cl. C07c *69/76;* **C09k** *3/04*
U.S. Cl. 252—408 **10 Claims**

Stability of cholesteric-phase liquid-crystal compositions is improved by incorporating therein cholesteryl p-nonylphenyl carbonate, a new compound, made by reaction of cholesteryl chloroformate with p-nonylphenol and pyridine. The p-nonylphenyl carbonate does not crystallize to true solid in three years, but the corresponding p-octylphenyl carbonate starts crystallizing to true solid in three weeks.

3,580,866
PROCESS FOR PRODUCING HIGH MOLECULAR WEIGHT POLYMERS OF ALKYLENE OXIDES
Teruhiko Ito, Naoshi Mitsui, Seiichiro Maeda, and Takeshi Kato, Kakogawa-shi, Japan, assignors to Seitetsu Kagaku Co., Ltd., Hyogo-ken, Japan
No Drawing. Filed Oct. 27, 1967, Ser. No. 678,516
Int. Cl. C08f *7/12*
U.S. Cl. 260—2 **41 Claims**

A process for producing a high molecular weight polymer of an alkylene oxide which comprises contacting an alkylene oxide with a novel catalyst at a temperature of from −50° C. to +150° C., said catalyst being prepared by partially hydrolyzing an aluminum alkoxide with water in an amount of 0.01 to 2.8 moles per mole of the alkoxide in a liquid, inert medium and mixing the resulting partial hydrolyzate with an organo-metallic compound of a metal of Group II or III of the Periodic Table in an amount of 0.001 to 2.5 moles per mole of the starting aluminum alkoxide. When the above polymerization is effected in the presence of a tertiary amine, the polymerization degree is increased.

3,580,867
PROCESS FOR PREPARING A CLOSED CELL EPDM SPONGE COMPOSITION
Lawrence Spenadel, Westfield, N.J., assignor to Esso Research and Engineering Company
Filed Aug. 30, 1967, Ser. No. 664,493
Int. Cl. C08d *13/10, 9/16*
U.S. Cl. 260—2.5 **7 Claims**

A compounded ethylene-propylene diene monomer (EPDM) suitable for use in manufacturing an improved closed cell sponge by the free expansion method and the process for preparing said compounded EPDM which comprises blending the EPDM with a reinforcing black and a chemical promoter and heat treating at an elevated temperature for a time sufficient to bond the EPDM to the reinforcing black, thereby increasing the tensile modulus of the EPDM.

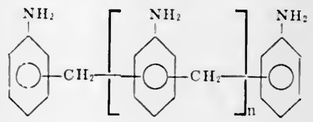
3,580,868
POLYISOCYANURATE RESIN AND FOAM FORMATION CATALYZED BY MANNICH BASES
Hans Joachim Diehr, Rudolf Merten, Helmut Piechota, and Konrad Uhlig, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Dec. 27, 1968, Ser. No. 787,559
Claims priority, application Germany, Jan. 2, 1968, P 17 20 769.1
Int. Cl. C08g *22/36, 22/46*
U.S. Cl. 260—2.5 **7 Claims**

Synthetic resins especially foams are prepared by polymerisation of compounds which contain more than one isocyanate group in the molecule, in the presence of Mannich base catalysts which are obtained by reaction between dimethylamine, formaldehyde and phenols which contain in the molecule at least one organic substituent which has at least 6 carbon atoms, optionally, in the presence of less than equivalent quantities of compounds which contain active hydrogen atoms and the usual auxiliary agents.

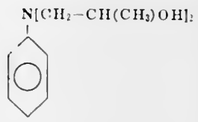
3,580,869
MICROCELLULAR POLYURETHANE FOAMS BASED ON AROMATIC POLYAMINES AND PROPOXYLATED ANILINE
Richard D. Rhodes, Jr., Somersworth, and Kirby E. L. Flanagan, Rochester, N.H., assignors to Davidson Rubber Company Inc., Dover, N.H.
No Drawing. Continuation-in-part of application Ser. No. 733,765, June 3, 1968. This application June 3, 1969, Ser. No. 830,095
Int. Cl. C08g *22/46*
U.S. Cl. 260—2.5 **2 Claims**

A microcellular polyurethane foam prepared by reacting in the presence of an organometallic catalyst:

(1) toluene diisocyanate;
(2) a polyol selected from the group consisting of:
  (A) organic triols having molecular weights of from about 1,500 to about 6,500 and
  (B) mixtures of (I) organic triols having molecular weights of from about 1,500 to about 6,500 and (II) organic diols having molecular weights of from about 400 to about 2,800;
(3) an aromatic amine having the formula:



where n equals from about 0.1 to about 0.3; and
(4) a propoxylated aniline having the formula:



proportions of (1) to (2) to (3) to (4) being such that:

(a) the ratio of —NCO to active hydrogen atoms is in the range of from 1.0:1.0 to 1.2:1.0;
(b) the ratio of $—NH_2$ groups of the aromatic amine to —OH groups is in the range of from 0.6:1.0 to 1.0:1.0; and
(c) the weight ratio of aromatic amine to the sum of aromatic amine and propoxylated aniline is from 0.45:1.0 to 0.95:1.0.

3,580,870
BEADED INJECTABLE SEALING COMPOSITION
Robert E. Rosner, Ferguson, Mo., assignor to McDonnell Douglas Corporation, St. Louis County, Mo.
Filed Dec. 6, 1968, Ser. No. 781,796
Int. Cl. C08j *1/14;* **B01j** *13/02*
U.S. Cl. 260—2.5 **4 Claims**

A sealant composition including a sealant medium containing specifically sized and shaped particle to improve the completeness of sealing the gaps and spaces that occur between a pair of sealable components due to manufacturing tolerances, the sealant composition being injected under pressure so that said particles are available to fill the gaps and spaces by a clustering formation to block the escape paths of the sealant medium, without interfering with the normal passage provided for distribution of the sealant composition.

3,580,871
PROCESS FOR THE MANUFACTURE OF POLYMER DISPERSIONS WITH POSITIVE ZETA POTENTIAL
Karl Josef Rauterkus, Kelkheim, Taunus, and Hamsjorg Vollmann, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Continuation-in-part of application Ser. No. 640,490, May 23, 1967. This application July 15, 1969, Ser. No. 842,005
Claims priority, application Germany, June 1, 1966, F 49,358
Int. Cl. C08f *1/13*
U.S. Cl. 260—17 **5 Claims**

Polymer dispersions with positive zeta potential produced by emulsion polymerization of at least one vinyl, vinylidene, acryl or methacryl compound in the presence of a free radical polymerization catalyst and in the presence of at least one basically substituted N-vinyl amide.

3,580,872
READY-TO-USE PHENOLIC ADHESIVES
Alan L. Lambuth, Bellevue, Wash., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Oct. 22, 1968, Ser. No. 769,702
Int. Cl. C08g *51/14;* **C08h** *17/26*
U.S. Cl. 260—17.2R **11 Claims**

A ready-to-use phenolic adhesive for the manufacture of plywood is described which contains a micronized solid residue of the acid hydrolysis of pentosan-containing materials. The adhesive is prepared by digesting the micronized solid residue in an alkali solution and then reacting phenol and formaldehyde in the solution containing the residue.

3,580,873
NONYELLOWING POLYURETHANE
Dominick Bianca, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Filed Oct. 18, 1967, Ser. No. 676,033
Int. Cl. C08g *22/08*
U.S. Cl. 260—18 **7 Claims**

A nonyellowing polyurethane prepared by reacting an isocyanato-terminated prepolymer with a mixture of monoethanolamine and triethanolamine in the presence of a catalytic amount of a metal drier compound such as calcium-, zinc- or lead naphthenate or octoate.

3,580,874
DYEABLE PILL-RESISTANT POLYESTERS
Akihiro Nishimura, Williamsburg, Va., assignor to Dow Badische Company, Williamsburg, Va.
No Drawing. Filed July 16, 1969, Ser. No. 842,389
Int. Cl. C08f *11/02, 21/04;* **C08g** *17/00*
U.S. Cl. 260—22 **15 Claims**

Improved polyesters consist of the condensation product of a polyhydric alcohol, a major proportion of a first

dibasic acid, a minor proportion of a long chain aliphatic dibasic acid having 28–44 carbon atoms, and a minor proportion of a long chain polyfunctional compound having 30–60 carbon atoms and at least three reactive sites.

3,580,875
POLISHING COMPOSITION
John M. Behnke, Newark, N.J., assignor to Bristol-Myers Company, New York, N.Y.
No Drawing. Filed Dec. 7, 1967, Ser. No. 688,662
Int. Cl. C09g *1/10*
U.S. Cl. 260—23 **2 Claims**

A composition used for polishing surfaces such as wood and Formica, comprised of synthetic wax, a combination of resins, a combination of plasticizers comprising a fatty acid amine soap and a fatty alcohol amine sulfate, and a non-aqueous solvent system.

3,580,876
FILM-FORMING COMPOSITION OF INTERPOLYMER LATEX AND COALESCING AGENT
Raymond A. Stone, Fairfield Farms, and Fred Lister and David S. Heller, Dover, Del., assignors to Standard Brands Chemical Industries, Inc., Dover, Del.
No Drawing. Filed Apr. 19, 1968, Ser. No. 722,536
Int. Cl. C08f *19/08, 45/24, 45/34, 45/38, 45/42;* **C08g** *37/26, 51/24, 51/34, 51/38, 51/42*
U.S. Cl. 260—29.4 **15 Claims**

An improved polymeric film-forming composition comprising (1) a latex of an interpolymer of an aliphatic conjugated diene, a monovinyl aromatic compound or mixtures thereof with other monovinyl compounds and an N-alkylol acrylamide and (2) a minor amount of a volatile organic azeotrope-forming coalescing agent and materials coated therewith.

3,580,877
EMULSION POLYMERS OF STYRENE AND UNSATURATED AMIDES
Alfred Reginald Corry, Dorthy Joyce Guest, and William Ian Williamson, Manchester, England, assignors to Imperial Chemical Industries Limited, London, England
No Drawing. Filed May 18, 1967, Ser. No. 639,302
Claims priority, application Great Britain, May 25, 1966, 23,406/66
Int. Cl. B01j *13/00;* **C08f** *15/02;* **C09d** *5/02*
U.S. Cl. 260—29.6RW **16 Claims**

Aqueous dispersions of water- and alkali-insoluble solid copolymers of a major proportion by weight of (a) styrene or of a substituted styrene or of mixtures of these, with a minor proportion by weight of (b) a neutral or acidic water-soluble monomer, and optionally with a minor proportion by weight of (c) a different neutral or acidic water-soluble monomer wherein monomer (b) is concentrated at or near the surface of the particles of the copolymer. The dispersions are useful for addition to liquid synthetic detergents to give them the appearance and creamy consistency of a hand lotion.

3,580,878
FLAME-RESISTANT ACRYLONITRILE COPOLYMERS WITH HIGH RECEPTIVITY TO ACID DYES
Iyohiko Nakanome, Kenji Takeya, Hiroshi Suzuki, and Yasuhiro Kitagawa, Saidaiji, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan
No Drawing. Filed June 13, 1968, Ser. No. 737,309
Claims priority, application Japan, July 1, 1967, 42/42,470; Sept. 26, 1967, 42/62,094
Int. Cl. C08f *15/40, 37/00, 45/24*
U.S. Cl. 260—29.6 **2 Claims**

Acrylonitrile copolymers which have high receptivity to acid dyes and are flame resistant, and are thus useful in making carpeting, curtains, etc. as well as wearing apparel, etc., are ternary polymers composed of acrylonitrile, vinylidene chloride, and a basic monomer of the type of the dimethylaminoethyl and diethylaminoethyl esters of acrylic acid and of methacrylic acid, and the corresponding N-substituted aminopropyl and aminobutyl esters, etc.; or copolymers consisting of acrylonitrile, vinylidene chloride, a basic monomer of the afore-indicated type and one or more neutral ethylenically unsaturated compounds (i.e. methyl acrylate, methyl methacrylate, vinyl acetate, styrene).

3,580,879
GELABLE COMPOSITIONS AND PROCESS OF USING THE SAME
Einosuke Higashimura, Tokyo, Katsumi Tamai, Ohtakeshi, and Eiichi Nakamura, Tokyo, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
No Drawing. Filed Aug. 29, 1967, Ser. No. 663,992
Claims priority, application Japan, Sept. 8, 1966, 41/59,358
Int. Cl. C08f *15/02;* **F21b** *33/13*
U.S. Cl. 260—29.7H **6 Claims**

A gelable, non-toxic and odorless composition for construction materials which comprises

(1) 1–90% by weight of metal methacrylates or acrylates, such as magnesium methacryate,
(2) 3–90% by weight of water-soluble ethenoid monomers, such as acrylamide and a compound of

$$CH_2{=}\overset{\overset{\displaystyle R}{|}}{C}{-}COOR'$$

(R is —H or —CH_3, and R′ is an alkyl having —OH or —NH_2), and
(3) 1–30% by weight of water-soluble divinyl monomers such as glyceroldiacrylate.

A process for stabilizing such construction materials as cement and soil, wherein an aqueous solution of the composition and a redox catalyst is added thereto, and high strength and superior impermeability to water can be provided. The period for gelation may be controlled as desired.

In a rapid stabilization process for construction materials adding a gelable composition comprising (1) water-soluble vinyl monomers and (2) water-soluble divinyl monomers and a redox catalyst thereto, the method wherein β-diketone is used as a component of the redox with or without metallic ions. Sodium formaldehyde sulfoxylate, a reducing sugar, a water-soluble amine can also be used as said component.

3,580,880
DISPERSIONS OF PARTICULATE SOLIDS IN EITHER LIPOPHILIC OR HYDROPHILIC LIQUIDS STABILIZED WITH A POLYMERIC AMPHIPATHIC STABILISER AND PROCESS FOR PREPARING SAID DISPERSIONS
Michael Raymond Clarke and Leon Filipowicz, Melbourne, Victoria, Australia, assignors to Balm Paints Limited, Melbourne, Victoria, Australia
No Drawing. Filed Nov. 20, 1967, Ser. No. 684,545
Claims priority, application Great Britain, Nov. 25, 1966, 52,826/66
Int. Cl. C08f *45/24;* **C08g** *53/18;* **C08j** *1/46*
U.S. Cl. 260—29.6R **16 Claims**

A process of preparing stable dispersions of particulate solids in either lipophilic or hydrophilic liquids by dispersing the solids in the liquid in the presence of a polymeric

amphipathic stabiliser which associates with the surface of the particles and provides a solvated steric barrier around them. The stabilisers comprise at least one chain-like component solvatable by a lipophilic liquid and with a chain-length equivalent to at least 12 covalent links together with at least one component solvatable by a hydrophilic liquid, each component being present in the weight proportion of at least 25% of the total weight of stabiliser. The stabilisers may comprise up to 10% by weight of ionizable groups, preferably co-reacted with counter-ions solvatably by a hydrophilic liquid.

3,580,881
POLYURETHANE COATING SYSTEM
Henry J. Lee, 12 Knollwood Drive, Cherry Hill, N.J. 08034
No Drawing. Filed Feb. 27, 1970, Ser. No. 15,227
Int. Cl. C08g *22/06, 51/34, 51/36*
U.S. Cl. 260—30.4 **10 Claims**

Present invention relates to a novel and improved method of protecting a surface with a polyurethane coating that exhibits outstanding chemical and physical properties. The improved process utilizes the ability of aromatic polyisocyanates to dimerize and trimerize and react with a short chain aliphatic glycol under carefully controlled conditions of heat to form a unique prepolymer. The prepolymer, when dissolved in a suitable solvent, has a prolonged stable shelf life and, when applied to the surface to be protected, cures itself on the mere evaporation of the solvent.

3,580,882
MICA-REINFORCED COMPOSITES
Lawrence E. Nielsen, Creve Coeur, and Joseph E. Fields, Ballwin, Mo., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Continuation-in-part of application Ser. No. 753,857, Aug. 20, 1968. This application Nov. 29, 1968, Ser. No. 780,272
Int. Cl. C08f *45/04*
U.S. Cl. 260—41 **5 Claims**

A shaped composite structure comprising finely comminuted mica as reinforcing filler in a matrix comprising the zinc salt of an acrylic acid polymer, and the method of preparing the same which comprises heating in a mold at a temperature of from about 175° C. to 400° C. and a pressure of from about 5,000 p.s.i. to 50,000 p.s.i. a mixture of zinc oxide and an acrylic acid polymer in contact with the mica.

3,580,883
METHOD OF CHEMICAL GROUT PROCESSING
Shigekazu Kasahara, Yuji Takahashi, Takashi Suzuki, Shinichi Umeda, Kazuo Adachi, and Yasuo Fukuda, Tokyo, Japan, assignors to Tekkosha Co., Ltd., Tokyo, Japan
No Drawing. Filed Jan. 14, 1969, Ser. No. 791,137
Claims priority, application Japan, Jan. 18, 1968, 43/2,385
Int. Cl. C08f *45/04*
U.S. Cl. 260—41 **9 Claims**

A composition of matter comprising a synthetic resin and a water soluble organic solvent which can dissolve said resin, which composition may also contain cement and/or sodium silicate, is injected into soil. The organic solvent is dissolved away by the ground water which is present in the soil and the remaining solid component fills the spaces in the soil, whereby water paths in the soil are blocked.

3,580,884
TETRAHYDROQUINOXALINE/ALDEHYDE REACTION PRODUCTS AS POLYMER ANTIOZONANTS
Farris H. Wilson, Jr., Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
No Drawing. Filed Mar. 29, 1968, Ser. No. 717,463
Int. Cl. C08f *11/04;* **C08g** *51/60*
U.S. Cl. 260—45.8 **7 Claims**

Polymers protected against ozone degradation by the incorporation of a reaction product produced by reacting a tetrahydroquinoxaline (1,2,3,4-tetrahydroquinoxaline) with an aldehyde (formaldehyde).

3,580,885
ANTIOZONANTS
Elmer A. Fike, Nitro, W. Va., assignor to Security Chemicals, Inc., Nitro, W. Va.
No Drawing. Filed Sept. 27, 1968, Ser. No. 763,381
Int. Cl. C08c *11/40, 11/54;* **C08d** *9/00*
U.S. Cl. 260—45.8 **11 Claims**

The invention relates to novel N-substituted dimethyl pyrroles for use as antiozonants in rubber.

3,580,886
POLYESTERS STABILIZED WITH AROMATIC ISOCYANATES
Mary J. Stewart, Media, and John A. Price, Swarthmore, Pa., assignors to FMC Corporation, Philadelphia, Pa.
No Drawing. Filed June 5, 1968, Ser. No. 734,534
Int. Cl. C08g *51/60*
U.S. Cl. 260—45.9 **9 Claims**

A thermal stabilized polyester comprising a highly polymeric linear polyester containing a stabilizing amount of an aromatic mono- or polyisocyanate.

3,580,887
ELASTOMERIC PRODUCTS OF EPOXY RESINS AND POLYETHER DISECONDARY AMINES
Allen J. Hubin, White Bear Lake, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.
No Drawing. Filed Apr. 21, 1969, Ser. No. 818,114
Int. Cl. C08g *30/14*
U.S. Cl. 260—47 **8 Claims**

An elastomeric reaction product of an epoxy resin and at least one amine having a minimum of 2 amino hydrogen atoms per molecule, at least one portion of said amine being a polyether disecondary amine.

3,580,888
WITHDRAWN

3,580,889
VULCANIZATION ACCELERATORS OF POLYCYCLIC ETHERS FOR FLUORINATED POLYMERS
Arthur Livingston Barney and Wolfgang Honsberg, Wilmington, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Continuation-in-part of abandoned applications Ser. No. 661,230, Aug. 17, 1967, and Ser. No. 731,325, May 22, 1968. This application Feb. 25, 1969, Ser. No. 802,236
Int. Cl. C08f *7/10, 3/20, 19/00*
U.S. Cl. 260—47 **17 Claims**

The acceleration of the vulcanization of saturated, fluorinated polymers by the use of cyclic polyethers. The accelerators enable a more rapid cure with conventional amine-based vulcanization systems and also enable a satisfactory rate and state of cure with weakly basic bisnucleophiles otherwise incapable of adequately curing fluorinated polymers.

3,580,890

BASIC CATALYSTS CONTAINING AROMATIC NUCLEI AND ARALIPHATICALLY BOUND TERTIARY AMINO GROUPS FOR THE POLYMERIZATION OF NCO GROUPS

Hans Joachim Diehr and Rudolf Merten, Leverkusen, Helmut Piechota, Leverkusen-Mathildenhof, and Konrad Uhlig, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 25, 1968, Ser. No. 770,800
Claims priority, application Germany, Oct. 31, 1967, F 53,928, F 53,929
Int. Cl. C08g *22/00*
U.S. Cl. 260—77.5 **13 Claims**

A process for the production of polyisocyanurates wherein compounds or mixtures of compounds containing at least two isocyanate groups are reacted in the presence of basic compounds containing at least two aromatic nuclei and at least on araliphatically bound tertiary amino function per molecule.

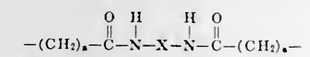
3,580,891

WATER-INSOLUBLE, CROSS-LINKED POLYMERIC REACTION PRODUCT OF ETHYLENE DIAMINE AND NITRILOTRIACETIC ACID OR DERIVATIVE

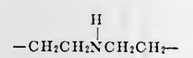
Norman B. Rainer, Richmond, Va., assignor to Seekay Chemical Company, Brooklyn, N.Y.

No Drawing. Filed Apr. 16, 1968, Ser. No. 721,585
Int. Cl. C08g *20/32*
U.S. Cl. 260—72 **4 Claims**

A solute is removed from an aqueous solution by contacting said solution with a cross linked polymer containing recurring nitrogen atoms interconnected at each valence by radials of the formula



wherein a is 1 or 2 and X is a divalent radical selected from the group $—CH_2CH_2—$, $—CH_2CH_2OCH_2CH_2—$ and



3,580,892

PROCESS FOR POLYMERIZING CYCLOPENTENE

Peter Gunther, Opladen, Wolfgang Oberkirch, Cologne-Stammheim, and Gottfried Pampus, Leverkusen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Nov. 5, 1969, Ser. No. 874,399
Claims priority, application Germany, Dec. 3, 1968, P 18 12 338.1
Int. Cl. C08f *5/00*
U.S. Cl. 260—93.1 **8 Claims**

A catalyst made from (1) a rhenium compound and (2) an aluminum organic compound polymerises cyclopentene to yield rubber-like products with high content of cis-linkages.

3,580,893

PROCESS FOR THE PREPARATION OF CYCLIC ACID ANHYDRIDES

William J. Heilman, Allison Park, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

No Drawing. Continuation-in-part of application Ser. No. 594,347, Oct. 25, 1966. This application May 26, 1969, Ser. No. 828,001
Int. Cl. C08f *27/12*
U.S. Cl. 260—78.5T **1 Claim**

A process is defined for heating an organic compound containing at least one half-ester of a dicarboxylic acid where the carbonyl groups are directly connected to adjacent internal aliphatic carbon atoms to a temperature in excess of about 80° C. to convert the half-ester groups to cyclic anhydride groups and a by-product alcohol. The organic compound is a 1:1 copolymer of an aliphatic hydrocarbon having at least three carbon atoms, such as 1-hexene, and maleic anhydride. The organic compound prepared from an olefin having from three to ten carbon atoms can be precipitated as a solid from its homogeneous reaction medium by pouring the reaction solution into a monohydroxy alcohol having one to four carbon atoms, such as methanol. Some methyl half-ester forms can be removed by heating the separated solid product at a temperature in excess of 80° C. while removing the monohydroxy alcohol. Thus, 1-hexene-maleic anhydride copolymers free of half-ester groups can be recovered. If the organic compound contains both half-ester and diester groups, the resulting compound after heating to a temperature in excess of 80° C. will contain anhydride and diester linkages.

3,580,894

UNIQUE POLYMERS AND PROCESSES FOR PRODUCING SAME

Gerd M. Lenke, Dover, Del., assignor to Standard Brands Chemical Industries, Inc., Dover, Del.

No Drawing. Filed Jan. 30, 1968, Ser. No. 701,556
Int. Cl. C08f *27/06*
U.S. Cl. 260—79.5 **16 Claims**

A unique class of phosphorus and sulfur-containing polymers comprising the reaction products of an unsaturated polymer and a hydrocarbyl phosphinodithioic acid and the processes for making them. These polymers are self-curing and many have superior adhesive properties.

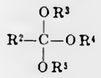
3,580,895

PRODUCTION OF COPOLYMERS IN THE PRESENCE OF AN ORGANOLITHIUM COMPOUND AND AN ORTHOESTER

Akira Onishi, Shiro Anzai, Koichi Irako, Ryota Fujio, Yoshihiro Hayakawa, and Shoji Miyamoto, Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

No Drawing. Filed Dec. 3, 1968, Ser. No. 780,898
Claims priority, application Japan, Dec. 11, 1967, 42/79,057
Int. Cl. C08f *19/08;* **C08d** *3/02*
U.S. Cl. 260—83.7 **21 Claims**

Random copolymer is prepared by copolymerizing a conjugated diene, such as 1,3-butadiene and a vinyl-substituted aromatic hydrocarbon, such as styrene at a temperature of −80° to 150° C. in the presence of a substantially anhydrous liquid hydrocarbon by means of a catalyst system consisting essentially of an organolithium compound and an orthoester having the general formula



wherein, R^2 is hydrogen or a hydrocarbon radical and R^3, R^4 and R^5 are hydrocarbon radicals.

3,580,896

AQUEOUS SUSPENSION POLYMERIZATION OF VINYL HALIDE POLYMERS IN THE PRESENCE OF ACRYLIC ACID

Elliott Farber, Trenton, N.J., assignor to Tenneco Chemicals, Inc.

No Drawing. Filed Mar. 6, 1968, Ser. No. 710,758
Int. Cl. C08f *15/30, 15/08, 15/26*
U.S. Cl. 260—87.1 **8 Claims**

Vinyl halide polymers are prepared in the form of uniform very small particles by incorporating in the monomer component of the polymerization mixture about 0.5 percent to 20 percent and preferably 1 percent to 10 percent by weight of acrylic acid, methacrylic acid, or mixtures thereof. Both the particle size and particle size distribution of vinyl halide homopolymers and copolymers with, for example, vinyl acetate, can be controlled in this way.

3,580,897

PROCESS FOR PRODUCING HYDROGENATED HYDROCARBON POLYMERS

Toshio Yoshimoto, Tsuneaki Narumiya, Seiya Kaneko, Hiroshi Yoshii, and Tetsuya Takamatsu, Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

No Drawing. Filed Nov. 14, 1968, Ser. No. 775,922
Claims priority, application Japan, Nov. 27, 1967, 42/75,633
Int. Cl. C08d *5/02;* **C08f** *27/25*
U.S. Cl. 260—85.1 **12 Claims**

Hydrogenated hydrocarbon polymers can be obtained in a continuous step comprising polymerizing or copolymerizing conjugated 1,3-diolefin in an inert atmosphere and in an inert solvent by using a catalyst based on an alkali metal or an alkali metal hydrocarbyl to obtain a polymer solution and then mixing homogeneously an organic compound of nickel or cobalt soluble in the inert solvent with the resulting polymer solution without isolating the resulting polymer and catalytically hydrogenating the unsaturated bond of the resulting polymer. In this process the alkali metal or alkali metal hydrocarbyl in the polymerization catalyst, which remains in the resulting polymer after the polymerization acts to effect the reduction of the organic compound of nickel or cobalt to produce the hydrogenation catalyst.

3,580,898

VAPOR PHASE POLYMERIZATION OF BUTENE-1

Milton K. Rosen, Flemington, and Charles D. Mason, Florham Park, N.J., assignors to Allied Chemical Corporation, New York, N.Y.

No Drawing. Filed May 28, 1968, Ser. No. 732,528
Int. Cl. C08f *1/42, 3/12*
U.S. Cl. 260—93.7 **10 Claims**

Vapor phase polymerization of butene-1 using Ziegler-Natta stereoregulating catalyst with diethyl aluminum chloride as co-catalyst. Maintaining initial temperature less than about 26° C. affords powder or granular poly(butene-1) resin of high isotacticity, suitable for powder molding. After initial phase of polymerization (when sufficient polymer has been formed to fill at least about 10% of the reactor volume), temperature and pressure can be raised in order to increase reaction rate without causing agglomeration of product. Molecular weight of poly(butene-1) is controlled without affecting granularity by supplying hydrogen into the reaction medium.

3,580,899

POLYMERIZATION OF ISOPRENE

Jean-Marie Massoubre, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, Clermont-Ferrand, Puy-de-Dome, France

No Drawing. Filed May 10, 1967, Ser. No. 637,327
Claims priority, application France, May 16, 1966, 1,856; Feb. 10, 1967, 94,608
Int. Cl. C08d *3/10*
U.S. Cl. 260—94.3 **7 Claims**

A polymerization catalyst comprising a mixture of (1) a hydrocarbon solution of a complex of a diaryl ether, such as diphenyl ether, and a tetravalent titanium salt, such as titanium tetrachloride, and (2) a hydrocarbon solution of a trialkyl aluminum compound, such as triisobutyl aluminum; the catalyst desirably further containing a diene compound, such as butadiene or isoprene, and being useful in a process for the rapid polymerization of isoprene in high yield into high molecular weight polymers which can be free from gel.

3,580,900

WATER-SOLUBLE QUATERNARY AMINE CONTAINING MONOAZO DYESTUFFS

Eberhard Mundlos, Frankfurt am Main, Reinhard Mohr, Offenbach am Main, Gunther Trapp, Frankfurt am Main, and Kurt Hohmann, Offenbach am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

No Drawing. Filed Oct. 1, 1968, Ser. No. 764,304
Claims priority, application Germany, Oct. 21, 1967, P 16 44 230.1
Int. Cl. C07c *107/06;* **C09b** *45/22, 29/01*
U.S. Cl. 260—149 **6 Claims**

Water-soluble basic monoazo dyestuffs which are suitable for the dyeing or printing of textile fibrous materials consisting of native or regenerative cellulose, polyamides, polyesters, polyacrylonitrile or polyvinylidene cyanide.

3,580,901

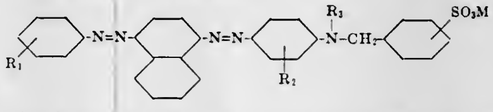
MAROON DISAZO DYES FOR POLYAMIDE FIBERS

James F. Feeman, Wyomissing, Pa., assignor to Crompton & Knowles Corporation, Worcester, Mass.

No Drawing. Filed Nov. 14, 1968, Ser. No. 775,950
Int. Cl. C09b *31/04;* **D06p** *1/02*
U.S. Cl. 260—191 **6 Claims**

Compounds that are useful as neutral dyeing dyes for polyamide fibers and dye such fibers in level, lightfast maroon shades.

The dyes have the structure:



wherein R_1 represents —H, $—CH_3$, $—OCH_3$ or —Cl; R_2 represents —H or $—CH_3$; R_3 represents lower alkyl having 1 to 4 C atoms and M represents —H, —Na, —K or $—NH_4$.

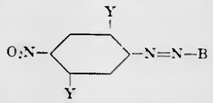
3,580,902

WATER-INSOLUBLE MONOAZO DYESTUFFS

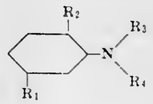
Hans-Joerg Angliker, Basel, Switzerland, assignor to Ciba Limited, Basel, Switzerland

No Drawing. Filed Oct. 4, 1967, Ser. No. 672,721
Claims priority, application Switzerland, Oct. 11, 1966, 14,691/66
Int. Cl. C09b *29/08, 29/36, 29/38*
U.S. Cl. 260—207 **4 Claims**

Water-insoluble mono-azo dyestuff of the formula



in which one of the symbols Y represents a phenoxy, phenyl-lower alkoxy, phenylmercapto, phenyl-lower alkylmercapto, phenyl nitrophenyl or phenyl-lower alkyl group and the other represents a hydrogen atom, a lower alkyl, lower alkoxy, phenylmercapto, phenyl-lower alkylmercapto phenyl or phenyl-lower alkyl group and B represents the radical of a coupling component selected from the group consisting of a pyrazolone, barbituric acid, 8-hydroxyquinoline and a compound of the formula



in which R_1 represents hydrogen, halogen, lower alkyl, lower alkoxy, lower alkanoylamino, phenoxy, phenylmercapto phenyl, R_2 represents hydrogen, lower alkyl or lower alkoxy, R_3 and R_4 each represents lower alkyl, cyano-lower alkyl, or lower alkanoyloxy-lower alkyl, dye polyester fibers yellow to red tints of excellent fastness to light and sublimation.

3,580,903
KETODEXTRAN COMPOUNDS
Anthony N. de Belder and Bernt J. Lindberg, Uppsala, Sweden, assignors to Pharmacia AB, Uppsala, Sweden
No Drawing. Filed Apr. 2, 1969, Ser. No. 812,848
Claims priority, application Sweden, Apr. 8, 1968, 4,696/68
Int. Cl. C08b *25/04*
U.S. Cl. 260—209D **2 Claims**

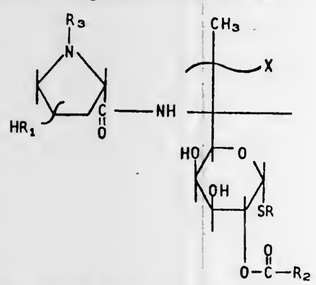
Derivative of dextran represented by the general formula:

$$A[CH(OH)]_{m-n}[CO]_n$$

wherein *m* represents the number of secondary alcohol groups in dextran having the formula $A[CH(OH)]_m$, and wherein *n* is a number chosen such that the degree of substitution *n/m* lies between 0.01 and 0.05, and wherein $[CH(OH)]_m$ represents the groups bearing the secondary alcohol groups of the dextran and A represents the remainder of the dextran. The dextran derivatives are very useful in intermediate products and may be reacted with a number of substances to form valuable and useful products. Such can be employed as a carrier for pharmaceuticals containing hydrazine and amino groups.

3,580,904
7-HALO-7-DEOXY-LINCOMYCIN DERIVATIVES
Walter Morozowich and Anthony A. Sinkula, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Continuation-in-part of application Ser. No. 637,358, May 10, 1967. This application Apr. 3, 1969, Ser. No. 813,341
The portion of the term of the patent subsequent to Feb. 4, 1986, has been disclaimed
Int. Cl. C07c *47/18*
U.S. Cl. 260—210 **26 Claims**

Antibacterial compounds of the formula:



and the salts thereof, and the 3,4-O-arylidene derivatives.

3,580,905
3(AMINOALKOXYCARBONYLALKYLENE) STEROID DERIVATIVES
Ivor James Stewart Brown, Richard Clarkson, Neville Stanton Crossley, and Bernard Joseph McLoughlin, Macclesfield, England, assignors to Imperial Chemical Industries, Limited, London, England
No Drawing. Filed June 14, 1968, Ser. No. 736,951
Claims priority, application Great Britain, June 22, 1967, 28,824/67
Int. Cl. C07c *169/00, 173/00*
U.S. Cl. 260—210.5 **3 Claims**

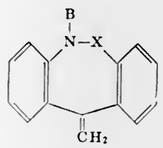
The disclosure relates to 3-aminoalkoxycarbonylmethylene derivatives of steroids, processes for their manufacture, pharmaceutical compositions containing them and a method of using them to increase the force of contraction of the heart of warm-blooded animals. Representative of the steroid derivatives disclosed are 3-(2-dimethylaminoethoxycarbonylmethylene) - 17β - (β - D - glucopyranosyloxy) - 5α - androstane and the tetra-O-acetate thereof.

3,580,906
STARCH LEVULINATES
Edward Bernasek, Winston-Salem, N.C., and Calley Neil Eaton, New York, N.Y., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
No Drawing. Filed Sept. 25, 1968, Ser. No. 762,645
Int. Cl. C08b *19/02*
U.S. Cl. 260—233.5 **5 Claims**

Levulinate esters of starch are prepared by reacting starch with alpha-angelica lactone under controlled conditions of temperature and pH. The resulting starch levulinates may be used in food, cosmetic, adhesive, and paper and textile sizing applications, etc.

3,580,907
MORPHANTHRIDINE DERIVATIVES
Max Thiel and Kurt Stach, Mannheim, Wolfgang Schaumann, Mannheim-Waldhof, and Annemarie Ribbentrop, Mannheim, Germany, assignors to Boehringer Mannheim Gesellschaft mit beschrankter Haftung
No Drawing. Filed Jan. 24, 1967, Ser. No. 611,240
Claims priority, application Germany, Feb. 18, 1966, B 85,866
Int. Cl. C07d *41/04, 41/06*
U.S. Cl. 260—239 **16 Claims**

Morphanthridine derivatives of the formula



wherein B is H or the group —A—Am, wherein Am is a secondary amino group, A is a straight or branched chain alkylene group and X is a methylene or carbonyl group. The pharmacologically acceptable salts of the compounds wherein B is —A—Am are also within the scope of the invention as are the pharmaceutical compositions containing the latter compounds and the method of using the same. The morphanthridine derivatives possess psychodynamic properties, being particularly adapted for use as antidepressive agents.

3,580,908
PROCESS FOR THE CONVERSION OF α-CARBOARYLOXYBENZYLPENICILLINS TO α-CARBOXYBENZYLPENICILLINS
Kenneth Butler, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.
No Drawing. Filed Oct. 17, 1968, Ser. No. 768,548
Int. Cl. C07d *99/16*
U.S. Cl. 260—239.1 **6 Claims**

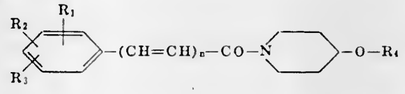
The controlled hydrolysis of α-carbobenzyloxybenzylpenicillin and α-carboaryloxybenzylpenicillins, such as α-carbophenoxybenzylpenicillin, under alkaline conditions to α-carboxybenzylpenicillin salts.

3,580,909
4-STYRYLPYRIDINES
Hanns Hanina Lehr, Montclair, N.J., assignor to Hoffmann-La Roche, Inc., Nutley, N.J.
No Drawing. Filed Dec. 9, 1968, Ser. No. 782,412
Int. Cl. C07d *31/20, 31/24*
U.S. Cl. 260—240 **12 Claims**

4-styrylpyridines, prepared by reacting appropriately substituted pyridines and aromatic aldehydes, are described. The end products are useful as anticonvulsants.

3,580,910
p-ALKOXY-PIPERIDINE-AMIDES
Max Thiel, Mannheim, Wolfgang Kampe, Heddesheim, Kurt Stach and Wolfgang Schaumann, Mannheim-Waldhof, and Annemarie Ribbentrop, Mannheim, Germany, assignors to Boehringer Mannheim Gesellschaft mit beschrankter Haftung
No Drawing. Filed Jan. 18, 1968, Ser. No. 698,701
Claims priority, application Germany, Jan. 25, 1967, B 90,888
Int. Cl. C07d *29/18*
U.S. Cl. 260—240 **3 Claims**

A series of novel p-alkoxy-piperidine-amides having the formula:



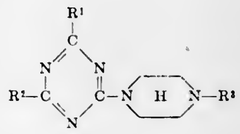
wherein R_1, R_2 and R_3 are each hydrogen, halogen, hydroxyl, alkoxy, alkyl or trifluoromethyl, R_4 is lower alkyl, and *n* is 0 or 1, constituting useful chemotherapeutic agents particularly because of their anticonvulsive, tranquilizing and sedative actions.

3,580,911
PHOTOGRAPHIC MATERIALS
John D. Mee and Donald W. Heseltine, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
No Drawing. Application July 22, 1968, Ser. No. 746,260, now Patent No. 3,501,312, dated Mar. 17, 1970, which is a continuation-in-part of application Ser. No. 609,792, Jan. 17, 1967. Divided and this application Aug. 5, 1969, Ser. No. 870,922
Int. Cl. C09b *23/06*
U.S. Cl. 260—240.65 **4 Claims**

Trimethine cyanine dyes are provided which contain a 3-indole nucleus which contains either a fused aromatic ring, an alkylene bridge or a 2-heterocyclic substituent.

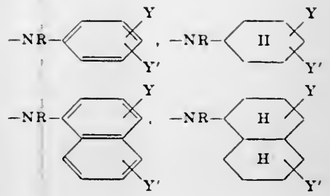
3,580,912
BIOLOGICALLY ACTIVE SUBSTITUTED-S-TRIAZINES
Werner Heimberger and Hermann Schmitt, Hanau am Main, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany
No Drawing. Filed Nov. 30, 1967, Ser. No. 686,790
Claims priority, application Germany, Dec. 3, 1966, D 51,705
Int. Cl. C07d *55/22*
U.S. Cl. 260—247.5R **5 Claims**

Substituted-s-triazines having anti-inflammatory action of the formula



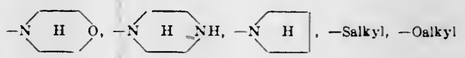
I

in which R^1 is —NRAlky,

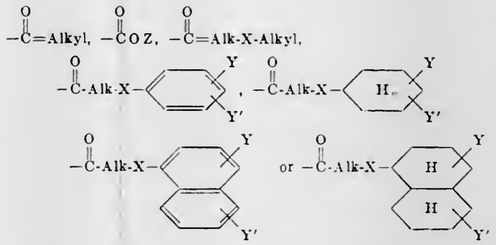


wherein

alkyl is alkyl or alkyl substituted with CN or cl;
R has the same significance as alkyl but in addition can be hydrogen;
each of Y and Y′ are hydrogen, halogen, NO_2, —alkyl, —Oalkyl, OH or COOH;
R^2 is



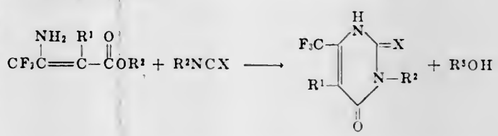
R^3 is



in which X is O or S, Z is alkyl, phenyl, naphthyl or cyclohexyl, Alk is alkylene and the alkyl and alkylene included in R, R^1 to R^3 and Z having up to 6 carbon atoms and their pharmocologically acceptable acid addition salts.

3,580,913
PROCESS FOR PREPARING SUBSTITUTED-6-TRIFLUOROMETHYLURACILS
Albert William Lutz, Princeton, N.J., assignor to American Cyanamid Company, Stamford, Conn.
No Drawing. Filed June 17, 1968, Ser. No. 737,288
Int. Cl. C07d *51/30, 51/32*
U.S. Cl. 260—260 **7 Claims**

Herbicidal uracils are prepared in accordance with the following equation:



The single step reaction is carried out in the presence of a solvent and an alkali metal hydride or alkali metal alkoxide.

In the above equation:

R^1 is hydrogen or lower alkyl,
R^2 is alkyl, alkenyl, cycloalkyl, phenyl, benzyl, or specific mono and disubstituted derivatives thereof,
R^3 is lower alkyl, and
X is oxygen or sulfur.

3,580,914
DERIVATIVES OF N-METHYLPIPERAZINE
Andrea Pedrazzoli and Leon Dall'Asta, Milan, Italy, assignors to Societe d'Etudes de Recherches et d'Application Scientifiques et Medicales E.R.A.S.M.E., Paris, France
No Drawing. Filed Aug. 14, 1967, Ser. No. 660,227
Claims priority, application Great Britain, Aug. 23, 1966, 37,827/67
Int. Cl. C07d *51/64*
U.S. Cl. 260—268 **2 Claims**

N-methyl-N'-ethyl-piperazines in which the ethyl radical is β,β-disubstituted with (1) a phenyl or phenoxymethylene radical which is unsubstituted or substituted in the ring with straight or branched aliphatic chains having 4 to 12 carbon atoms or cycloalkyl groups having 5 to 6 carbon atoms or with 2 or 3 chlorine atoms or with 2 chlorine atoms and a nitro group, and (2) a benzoyloxy or phenoxyacetyloxy radical which is unsubstituted or substituted in the ring with 1, 2 or 3 chlorine atoms or with 2 chlorine atoms and a nitro group or a benzyloxy radical substituted in the ring with 1, 2 or 3 chlorine atoms; and pharmaceutically acceptable acid addition salts thereof. All of the compounds have antibacterial and antiprotozoan activity.

3,580,915
1,2,3,4-TETRAHYDROBENZO[b][1,6]NAPHTHYRIDINE DERIVATIVES
Milton Wolf, West Chester, and James L. Diebold, Havertown, Pa., assignors to American Home Products Corporation, New York, N.Y.
No Drawing. Continuation-in-part of applications Ser. No. 533,802, Ser. No. 533,793, both Mar. 14, 1966, and Ser. No. 581,756, Sept. 22, 1966. This application Sept. 16, 1968, Ser. No. 760,063
Int. Cl. C07d *39/00*
U.S. Cl. 260—286 **6 Claims**

This invention concerns 1,2,3,4 - tetrahydrobenzo[b][1,6]naphthyridine, 1,2,3,4,4a,5,10,10a - octahydrobenzo[b][1,6]naphthyridines and the pharmacologically acceptable acid addition salts thereof which are pharmacologically active as central nervous system depressants which are useful in producing a calming effect in warm-blooded animals. Further, this invention concerns a process for the preparation of 10 - amino - 1,2,3,4 - tetrahydrobenzo[b][1,6]naphthyridines.

3,580,916
HYDROXYESTERS OF HEXA- AND OCTAHYDROINDOLOQUINOLINES
William L. Garbrecht, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
No Drawing. Filed Feb. 20, 1969, Ser. No. 801,144
Int. Cl. C07d *43/20*
U.S. Cl. 260—285.5 **13 Claims**

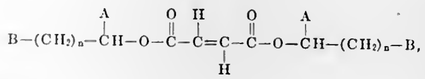
Esters of lysergic and dihydrolysergic acids, including 4-alkyl, 4-alkenyl and 4-aralkyl derivatives thereof, in which the esterifying group is derived from a dihydroxy or trihydroxy alkyl alcohol having from two to eight carbon atoms or a C_5 to C_{11} cycloalkyl dihydroxy alcohol, having from 5 to 8 ring carbon atoms, the esters having neurosedative activity in animals.

3,580,917
PROCESS FOR PRODUCING PYRIDINE BASES
Yoshiaki Numa and Akio Nakamachi, Saitama, and Yasukazu Murakami, Kawasaki-shi, Kanagawa, Japan, assignors to Daicel Ltd., Osaka, Japan
No Drawing. Filed June 13, 1968, Ser. No. 736,560
Claims priority, application Japan, June 14, 1967, 42/37,595
Int. Cl. C07d *31/02*
U.S. Cl. 260—290 **6 Claims**

A process for producing β-picoline and pyridine in which a gaseous mixture of acrolein and propylene oxide are reacted with ammonia in the gas phase at an elevated temperature in the presence of a solid acid catalyst so that β-picoline and pyridine are produced at a high yield and without producing γ-picoline.

3,580,918
METHOD FOR THE PREPARATION OF AMINOALKYL FUMARATES
Frizian Nikolaevich Bodnarjuk and Mikhail Alexeevich Korshunov, Yaroslavl, U.S.S.R., assignors to Nauchno-Issledovatelsky Institut Monomerov Dlya Sinteticheskogo, Yaroslavl, U.S.S.R.
No Drawing. Filed Sept. 3, 1968, Ser. No. 757,122
Int. Cl. C07c *101/00*
U.S. Cl. 260—294.3 **3 Claims**

Aminoalkyl fumarates having the following formula:



wherein:

B is selected from the group consisting of tertiary aliphatic amino groups containing from 2 to 12 carbon atoms and piperidino;
A is H, CH_3 or CH_2—B, and
n is an integer of 1 to 2,

are produced by reacting maleic anhydride and amino alcohols having the general formula

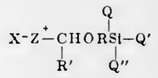
at reflux temperature in the presence of an esterification catalyst and an inert solvent while bubbling nitrogen through the reaction mixture and continuously distilling off the water formed in the course of the reaction in the form of an azeotrope with the solvent. The aminoalkyl fumarates may be copolymerized with other vinyl type monomers to incorporate polar amino groups into polymer molecules to improve the characteristics of colorability, adhesion to various materials, resistance to temperature shocks and antistatic properties.

3,580,919
PROCESS FOR PREPARATION OF NAPHTHYRIDINE DIONE DYESTUFFS
Walter R. Demler, Hamburg, and Arthur F. Jachlewski, Buffalo, N.Y., assignors to Allied Chemical Corporation, New York, N.Y.
No Drawing. Filed Apr. 30, 1968, Ser. No. 725,481
Int. Cl. C07d *31/44*
U.S. Cl. 260—295 **18 Claims**

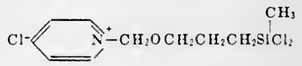
An improved process for preparing water-insoluble dyes of the naphthyridine dione series by reaction of an indigo with an aryl acetyl halide in the presence of an inorganic acid halide preferably a thionyl halide and an aroyl halide, said indigo, aryl acetyl halide and aroyl halide being free of water-solubilizing substituents. The improved process provides yields of naphthyridine dione dyestuffs which are as much as 60–110% greater than those realized by previously employed processes using an indigo and an aryl acetyl halide as starting materials while at the same time requiring as little as 30–75% of the costly aryl acetyl halide reactant.

3,580,920
CERTAIN PYRIDINIUM HALOETHER SILANES AND DERIVATIVES
Alan L. Culpepper, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
No Drawing. Continuation of application Ser. No. 641,713, Mar. 2, 1967, which is a division of application Ser. No. 314,879, Oct. 9, 1963. This application Apr. 14, 1970, Ser. No. 28,189
Int. Cl. C07d *31/28*
U.S. Cl. 260—297 **5 Claims**

Quaternary ammonium salts of the formula



where Q, Q' and Q'' are hydrogen, halogen, hydroxyl, monovalent hydrocarbon and halohydrocarbon radicals that are free of aliphatic unsaturation, $\overline{R}O$—, $\overline{R}COO$—, $\overline{R}_2C{=}N{-}O$, $\overline{R}{=}C{=}N{-}O$— or $R''O(CH_2CH_2O)_m$—, $\overline{R}$ is hydrocarbon or halohydrocarbon radicals, R'' is an alkyl, m is 1 or 2, R is divalent aliphatic or cycloaliphatic hydrocarbon radicals, R' is hydrogen or monovalent hydrocarbon radicals, Z is a tertiary amine radical, and X is a halogen atom as disclosed. An example of a quaternary ammonium salt is



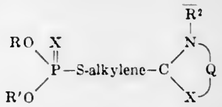
The quaternary ammonium salts are useful as water repellents and as intermediates in making siloxanes which are useful as water repellents especially for cellulosic fabrics.

3,580,921
HETEROCYCLIC MESOIONIC COMPOUNDS
Donald P. Cameron, New London, Conn., assignor to Pfizer Inc., New York, N.Y.
No Drawing. Filed Sept. 20, 1968, Ser. No. 761,319
Int. Cl. C07d *91/54*
U.S. Cl. 260—302 **12 Claims**

A series of novel aryl anhydro 1,2,3-thiadiazolium hydroxide bases and their acid addition salts have been prepared. The anhydro 4-hydroxy-3-(2-substituted phenyl)-1,2,3-thiadiazolium hydroxides produced are all active monoamine oxidase inhibitors and are useful in therapy as non-steroidal anti-inflamatory agents.

3,580,922
PHOSPHORYLATED HETEROCYCLIC COMPOUNDS
Glenn R. Price and Edward N. Walsh, Chicago Heights, Ill., assignors to Stauffer Chemical Company, New York, N.Y.
No Drawing. Filed Dec. 28, 1964, Ser. No. 421,609
Int. Cl. C07f *9/08, 9/16*
U.S. Cl. 260—304 **6 Claims**

Heterocyclic compounds containing thiophosphatoalkyl groups, useful as herbicides, having formula



where R and R' are lower alkyl, X is oxygen or sulfur, R^2 is H or lower alkyl, Q is ethylene, propylene, or phenylene.

3,580,923
RESOLUTION PROCESS
Thomas Leigh, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Jan. 22, 1969, Ser. No. 793,157
Claims priority, application Great Britain, Feb. 14, 1968, 7,321/68
Int. Cl. C07d *99/06*
U.S. Cl. 260—306.7 **4 Claims**

A process for the resolution of racemic tetramisole, a known anthelmintic agent, to produce the (−)-tetramisole, by formation of a salt with an arenesulphonyl-L-pyroglutamic acid or a di-aroyl-(+)-tartaric acid.

3,580,924
2-DIPHENYLBENZOXAZOLES
Rudolf Anliker, Binningen, Max Duennenberger, Frenkendorf, Karl Schmid, Reinach, Basel-Land, and Adolf Emil Siegrist, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland
No Drawing. Filed Dec. 27, 1966, Ser. No. 604,584
Claims priority, application Switzerland, Jan. 7, 1966, 196/66
Int. Cl. C07d *85/48*
U.S. Cl. 260—307 **4 Claims**

2-(diphenyl)-benzoxazoles useful as scintillator substances.

3,580,925
IMIDAZOLE PREPARATION
Philip Manos, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.
No Drawing. Original application May 23, 1966, Ser. No. 551,872. Divided and this application Dec. 26, 1968, Ser. No. 787,248
Int. Cl. C07d *49/00*
U.S. Cl. 260—309 **3 Claims**

The preparation of benzils from benzoins by reacting the benzoin with a cupric carboxylate catalyst in the presence of a solvent of acetic acid or a water-miscible alcohol at a temperature of 20° to 130° C. while passing oxygen into the reaction mixture. The preparation of imidazoles from benzils by adding, to the reaction mixture in the preceding sentence, ammonia or a weak acid salt thereof and a benzaldehyde.

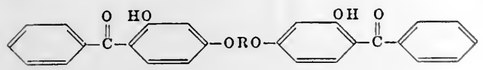
3,580,926
CARBAZOLE-4-ALKANOIC ACIDS AND TETRAHYDROCARBAZOLE-4-ALKANOIC ACIDS
Franklin W. Short, Saline, Mich., assignor to Parke, Davis & Company, Detroit, Mich.
No Drawing. Filed Nov. 10, 1969, Ser. No. 875,559
Int. Cl. C07d *27/68*
U.S. Cl. 260—315 **5 Claims**

9-phenylcarbazole-4-acetic acid and 5,6,7,8-tetrahydro-9-phenylcarbazole-4-acetic acid; o-fluoro, o-chloro, and α-methyl derivatives; and carboxylate salts of the foregoing compounds. The products are anti-inflammatory agents useful in relieving or preventing inflammation. They can be produced from the corresponding lower alkyl esters by hydrolysis. The intermediates can be produced from hexahydrodibenzofuran-1(2H)-one by reaction with aniline or a substituted aniline, introduction of an alkanoic acid ester side-chain, and dehydrogenation in the ring system.

3,580,927
ULTRAVIOLET LIGHT INHIBITORS
Robert L. Wear, West St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
No Drawing. Filed Nov. 24, 1967, Ser. No. 685,329
Int. Cl. C07d *3/00;* **C07c** *49/82*
U.S. Cl. 260—333 **3 Claims**

Ultraviolet light absorbers with extremely low volatility are prepared by reacting 2,4-dihydroxybenzophenone and

organic dihalides or diepoxides. The resultant compounds have the general formula



where R is a divalent organic radical. These compounds may be used as carriers for dye, permitting the internal coloring of polyester films and fibers.

3,580,928
PROCESS FOR PURIFYING ACETALS
Francis B. McAndrew, Springfield, Martin B. Price, Berkeley Heights, and Frank M. Berardinelli, South Orange, N.J., assignors to Celanese Corporation, New York, N.Y.
Filed Feb. 12, 1968, Ser. No. 704,905
Int. Cl. C07c *43/30;* **C07d** *13/02, 15/04, 17/00, 19/00*
U.S. Cl. 260—340 **5 Claims**

Acetals such as trioxane which contain impurities are purified by contacting them in the vapor state with liquid sodium in order to react the impurities with the liquid sodium whereby the impurities precipitate out as solids. The resulting purified acetal is separately recovered.

3,580,929
PROCESS FOR RECOVERING FERMENTATION ESTROGENIC SUBSTANCE
Phil H. Hidy and Vernon V. Young, Terre Haute, Ind., assignors to Commercial Solvents Corporation
No Drawing. Continuation-in-part of application Ser. No. 670,393, Sept. 25, 1967. This application Apr. 16, 1968, Ser. No. 721,604
Int. Cl. C07d *9/00*
U.S. Cl. 260—343.2 **19 Claims**

A process for the recovery of a fermentation product from a porous substrate such as recovery of the anabolic and estrogenic substance known at F.E.S., identified in U.S. Pat .No. 3,196,019, produced by cultivation of the microorganism *Gibberella zeae* (Gordon) on a porous substrate, especially from a synthetic fermentation medium which includes exfoliated vermiculite as a support for the microorganism and a nutrient production medium including sugar as the carbohydrate source and added minerals desired for proper growth of the microorganism. In this recovery process the porous substrate or fermentation cake is crushed and slurried with an aqueous alkaline solution to dissolve the normally water-insoluble F.E.S. The solution is then filtered and acidified to precipitate the F.E.S. which is recovered. The solution is heated prior to or during acidification to insure the production of easily filterable F.E.S. crystals.

3,580,930
PROCESS FOR PRODUCING GAMMA-BUTYROLACTONE
Bunji Miya, Fumiro Hoshino, and Morio Matuda, Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan
No Drawing. Filed Dec. 27, 1967, Ser. No. 693,744
Claims priority, application Japan, Dec. 29, 1966, 42/453
Int. Cl. C07d *5/06*
U.S. Cl. 260—343.6 **6 Claims**

A process for producing gamma-butyrolactone by hydrogenating maleic anhydride, maleic acid, fumaric acid, succinic anhydride or succinic acid or mixtures thereof, in the gas phase, in the presence of a Zn-Cu-Cr catalyst, in order to produce high yields of gamma-butyrolactone and minimize the formation of by-products.

3,580,931
5-(2-METHYLENEALKANOYL)-BENZOFURAN 2-CARBOXYLIC ACIDS
Janos Zergenyi, Riehen, and Ernst Habicht, Oberwil, Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.
No Drawing. Filed July 22, 1968, Ser. No. 746,262
Claims priority, application Switzerland, July 28, 1967, 10,764; Sept. 29, 1967, 13,637
Int. Cl. C07d *5/42*
U.S. Cl. 260—346.2 **10 Claims**

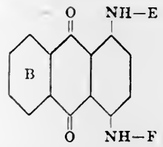
The production of 5-(2-methylene-alkanoyl)-benzofuran-, 5-(2-methylene-alkanoyl)-indole- and 5-(2-methylene-alkanoyl)-benzol[b]thiophene-2-carboxylic acids by reaction of the corresponding 5-(2-dimethylaminomethyl-alkanoyl)-derivatives with sodium acetate in glacial acetic acid and their pharmaceutically acceptable salts with bases, a method of producing a diuretic and saluretic effect in mammals comprising administering said compounds to said mammals and pharmaceutical compositions containing said compounds are described. A typical embodiment is 5-(2-methylene-butyryl)-6-methyl-benzofuran-2-carboxylic acid.

3,580,932
PHARMACOLOGICALLY ACTIVE DIETHYL-(2-DIBENZOFURANYL)-MALONATE
Bruno Cavalleri, Milan, and Elvio Bellasio, Albate, Italy, and Emilio Testa, Ticino, Switzerland, assignors to Lepetit S.p.A.-Gruppo per la Ricerca Scientifica e la Produzione Chimica Farmacettica, Milan, Italy
No Drawing. Filed May 3, 1968, Ser. No. 726,556
Int. Cl. C07d *5/44*
U.S. Cl. 260—346.2 **1 Claim**

The invention is concerned with diethyl α-(2-dibenzofuranyl)-malonate, a substance with high antiinflammatory activity. A method for the preparation of the new compound is also described.

3,580,933
ANTHRAQUINONE DYES, THEIR PRODUCTION AND USE
Jacques Guenthard, Binningen, Basel-Land, Switzerland, assignor to Sandoz Ltd. (also known as Sandoz A.G.), Basel, Switzerland
No Drawing. Filed Aug. 18, 1967, Ser. No. 661,551
Int. Cl. C09b *1/30, 1/50*
U.S. Cl. 260—372 **22 Claims**

Anthraquinone dyes of the formula



wherein:

E represents a sulfonated carboarylamido-alkylene group, F represents E or an alkyl- or cycloalkyl radical, and the ring B may bear further substituents.

3,580,934
CORROSION PREVENTION WITH SODIUM SILICATE AND SOLUBLE ZINC SALTS
William Bruce Murray, Long Beach, and Roy E. Wright, Oakland, Calif., assignors to Philadelphia Quartz Company of California, Berkeley, Calif.
No Drawing. Continuation-in-part of application Ser. No. 584,373, Oct. 5, 1966. This application Nov. 26, 1969, Ser. No. 880,365
Int. Cl. C23f *11/18*
U.S. Cl. 252—389 **9 Claims**

A process for retarding corrosion in metal tubes carrying water by treating said tubes with a combination of sodium silicate and a soluble zinc salt, and with the optional addition of a chelating or sequestering agent.

3,580,935
PROCESS FOR THE PREPARATION OF 3-ENOL ETHERS OF 3-KETO-Δ^4 - 6-(N-DISUBSTITUTED) AMINOMETHYL STEROIDS
Verlan H. VanRheenen, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Filed Nov. 19, 1969, Ser. No. 878,247
Int. Cl. C07c *169/00*
U.S. Cl. 260—397.1 **7 Claims**

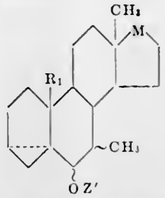
This invention relates to a novel and general process for the conversion of the 3-enol ethers of 3-keto-Δ^4-steroids, unsubstituted at the 4 and 6 positions, of the androstane, 19-norandrostane, pregnane, 19-norpregnane and spirostane series (1), into the corresponding 6-(N-disubstituted)aminomethyl derivatives (III). The compounds III have anabolic, androgenic, anti-fertility, anti-inflammatory and estrogenic activities, and are consequently useful in treating mammals, including humans, birds and other animals in those conditions and/or ailments where such activities are desired. The compounds of Formula III are additionally useful as intermediates in the preparation, by known methods, of the physiologically active and therapeutically useful 6-methyl steroids, such as medroxyprogesterone acetate (α-methyl-17α-hydroxy-4-pregnene - 3,20 - dione 17-acetate), dimethisterone [6α - methyl-17β-hydroxy-17α-(1-propynyl)-4-androsten-3-one], methylprednisolone (6α-methyl-11β,17α, 21-trihydroxy-1,4-pregnadiene-3,20-dione), fluoromethylone (6α-methyl-9α-fluoro-11β,17α-dihydroxy - 1,4 - pregnadiene-3,20-dione), etc.

3,580,936
5β-TAUROCHOLENIC ACIDS AND 5β-TAUROCHOLADIENIC ACIDS
Arthur A. Patchett, Cranford, and John Hannah, Matawan, N.J., assignors to Merck & Co., Inc., Rahway, N.J.
No Drawing. Continuation-in-part of application Ser. No. 677,080, Oct. 23, 1967. This application Oct. 2, 1968, Ser. No. 764,650
Int. Cl. C07c *169/54*
U.S. Cl. 260—397 **42 Claims**

5β-taurocholenic acids wherein the double bond may be either in the 22-position of the aliphatic chain or within the cholane ring; and 5β-taurocholadienic acids wherein one double bond is in the 22-position of the chain and the second is within the cholane nucleus; and the salts, esters and amide derivatives thereof. The instant products may be obtained: (1) via the reaction of a 5β-cholenic acid or 5β-choladienic acid with an alkyl haloformate in the presence of a base to afford a 5β-cholenic alkylcarbonic anhydride or 5β-choladienic alkylcarbonic anhydride, which intermediate is then treated with taurine in a basic medium to yield the desired 5β-taurocholenic acid salt or 5β-taurocholadienic acid salt; or (2) by the reaction of the acid halide of cholenic acid with either taurine or with a suitable taurine salt in the presence of a base. The products are hypocholesterolemics and hypolipemics which have utility in the treatment of conditions associated with blood lipid deposition.

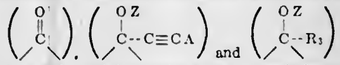
3,580,937
7α- AND 7β-METHYL-3α,5α-CYCLOANDROSTANES, 6-METHYL DERIVATIVES THEREOF AND THE 19-NOR ANALOGUES OF THE FOREGOING
J. Allen Campbell and John C. Babcock, Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.
No Drawing. Filed July 29, 1969, Ser. No. 845,877
Int. Cl. C07c *169/20*
U.S. Cl. 260—397.4 **10 Claims**

This invention relates to novel 7α- and 7β- methyl-3α,5α-cycloandrostanes and their 19-nor analogues embraced by the formula



II

wherein ∫ is a generic expression denoting α- and β- bonds and mixtures thereof; R_1 is selected from the group consisting of hydrogen and methyl; Z′ is selected from the group consisting of hydrogen, alkyl of from one through twelve carbon atoms and the acyl radical of a hydrocarbon carboxylic acid containing from one through twelve carbon atoms; M is selected from the group consisting of



wherein A is selected from the group consisting of hydrogen, alkyl of from one through four carbon atoms, chlorine, bromine, and trifluoromethyl; R_3 is selected from the group consisting of hydrogen, alkyl of from one through twelve carbon atoms and alkenyl of from two through twelve carbon atoms; Z is selected from the group consisting of hydrogen and the acyl radical of a hydrocarbon carboxylic acid containing from one through twelve carbon atoms. These compounds (III) have anti-fertility, hypocholesteremic, anabolic, estrogenic, antihormonal and central nervous system depressing activities. They are consequently useful in treating mammals, including humans, and birds in those conditions where the foregoing properties make the new compounds valuable in medical and veterinary practice. These compounds are additionally useful as intermediates in the preparation of the corresponding rearranged 3-hydroxy and 3-acyloxy-Δ^5-7-methyl steroids (e.g., those prepared and claimed in U.S. Pat. 3,380,886) wherein R_1 and M are the same as given above for the compounds of Formula III. The aforesaid Δ^5-steroids are highly potent estrogen, anti-fertility and cholesterol-lowering agents.

3,580,938
PREPARATION OF DIALKYL GROUP IIIa METAL-DIACYLMETHANE
Wolfram R. Kroll, Linden, N.J., assignor to Esso Research and Engineering Company
No Drawing. Continuation-in-part of application Ser. No. 584,964, Oct. 7, 1966. This application Aug. 29, 1968, Ser. No. 756,282
Int. Cl. C07f *5/00, 5/04, 5/06*
U.S. Cl. 260—448A **34 Claims**

Substantially pure dialkyl metal diacylmethanes such as dialkylaluminum acetylacetonates having excellent catalytic properties can be obtained for the first time in such a high state of purity by reacting stoichiometrically certain Group III metal-tris-diacylmethanes such as aluminum-tris-acetylacetonate with a trialkyl metal such as trialkylaluminum.

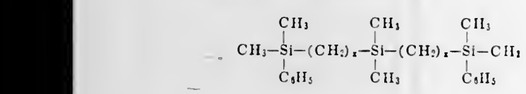
3,580,939
AMINOSILANES AND COMPOSITIONS CONTAINING THEM
Louis Ceyzeriat, Lyon, and Maurice Galgnon and Marcel Lefort, Rhone, France, assignors to Rhone-Poulenc S.A., Paris, France
No Drawing. Filed Apr. 22, 1968, Ser. No. 723,250
Claims priority, application France, May 9, 1967, 105,751
Int. Cl. C07f *7/10*
U.S. Cl. 260—448.2N **2 Claims**

The invention provides new trisaminosilanes containing a 2,2 - dichlorocyclopropyl group and organopoly-

siloxane compositions containing the same as cross-linking agents which are storage-stable in the absence of moisture but cure rapidly at ambient temperature in the presence of moisture.

3,580,940
TRISILYLALKANES
James A. Webster, Dayton, Ohio, assignor to Monsanto Research Company, St. Louis, Mo.
No Drawing. Filed Aug. 25, 1969, Ser. No. 852,869
Int. Cl. C07f *7/02;* **C10m** *1/50*
U.S. Cl. 260—448.2 **2 Claims**

Trisilaalkanes of the formula



where $x=2$–6, useful as functional fluids. The areas of utility are heat-exchange media, gyro fluids, lubricants, anti-corrosive agents and viscosity-index improvers.

3,580,941
AMINOCYCLOTETRASILOZANES
Christopher A. Pearce and Norman C. Lloyd, Glamorgan, Wales, assignors to Midland Silicones Limited, Reading, England
No Drawing. Original application May 21, 1968, Ser. No. 730,940, now Patent No. 3,518,290, dated June 30, 1970. Divided and this application Feb. 19, 1970, Ser. No. 12,836
Claims priority, application Great Britain, May 26, 1967, 24,693/67
Int. Cl. C07f *7/02*
U.S. Cl. 260—448.2 **3 Claims**

Novel compositions of matter and processes for preparing bicyclo- and aminocyclotetrasilazanes. The aminocyclotetrasilazanes are used to form bicyclotetrasilazanes by heating at temperatures above 210° C. under substantially anhydrous conditions.

3,580,942
CHLOROSULPHONYL-TERT.-BUTYLISOCYANATE AND ITS PREPARATION
Dieter Arlt, Cologne-Buchheim, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed June 18, 1968, Ser. No. 737,859
Claims priority, application Germany, June 21, 1967, F 52,748
Int. Cl. C07c *119/04*
U.S. Cl. 260—453 **2 Claims**

2 - isocyanato - 2,2 - dimethyl-ethane-sulphonic acid chloride is prepared by reacting isobutylene and cyanogen chloride with chlorosulphonic acid or sulphur trioxide. This compound is suitable for the modification of polyurethanes, for reaction with reactive hydrogen containing compounds and it is particularly useful as a cross linking agent for photo lacquers.

3,580,943
DIBENZOCYCLOHEPTENE DERIVATIVES
Donald L. Trepanier, Indianapolis, Ind., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Sept. 3, 1968, Ser. No. 757,106
Int. Cl. C07c *121/64, 153/05, 159/00*
U.S. Cl. 260—453 **6 Claims**

Dibenzocycloheptene derivatives such as methylthio 10,11 - dihydro - 5H - dibenzo(a,d)cycloheptene-Δ5,9-butyrimidate and the hydrohalide salts thereof such as the hydroiodide and hydrobromide salts. The compounds are useful in the study of animal behavior and are particularly useful as central nervous system antidepressants and as agents for controlling the appetite of animals.

3,580,944
UNSATURATED ALKYL SULFAMATES AND METHOD OF PREPARATION
Robert W. Hill, Leawood, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
No Drawing. Filed Aug. 28, 1967, Ser. No. 663,568
Int. Cl. C07c *143/68;* **C08f** *45/46*
U.S. Cl. 260—456 **4 Claims**

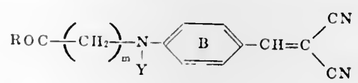
Alkenyl sulfamates having 10 to 22 carbon atoms, such as erucyl sulfamate and oleyl sulfamate, are prepared by refluxing the correspond alkenol with sulfamide in a suitable solvent, such as dioxane, until evolution of ammonia ceases. These alkenyl sulfamates are useful as slip additives in mono-olefin polymers, such as polyethylene or polypropylene, when added in amounts from 0.005 to 1 percent by weight.

3,580,945
DERIVATIVES OF 2-OXOCYCLOPENTANE CARBOXYLIC ACID
Real Laliberte, Laval, Quebec, Canada, assignor to Ayerst, McKenna & Harrison, Ltd., St. Laurent, Quebec, Canada
No Drawing. Filed Mar. 21, 1969, Ser. No. 809,412
Int. Cl. C07c *121/46*
U.S. Cl 260—464 **3 Claims**

Lower alkyl esters of 2-oxocyclopentane carboxylic acid cyanoacethydrazone, prepared from the corresponding lower alkyl ester of 2-oxocyclopentane carboxylic acid and cyanoacethydrazide. The compounds are useful as anti-parasitic agents.

3,580,946
CYANO CONTAINING STYRYL DYESTUFFS
Kenneth Anderton, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England
No Drawing. Filed Dec. 13, 1968, Ser. No. 783,767
Claims priority, application Great Britain, Dec. 29, 1967, 44,095/67; Sept. 17, 1968, 59,093/68
Int. Cl. C07c *121/50*
U.S. Cl. 260—465 **1 Claim**

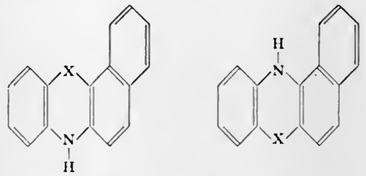
Water-insoluble styryl dyestuffs of the formula:



wherein R is —OR^1 or —NR^2R^3, R^1 is an optionally substituted hydrocarbon radical, R^2 and R^3 are independently hydrogen or optionally substituted hydrocarbon, Y is hydrogen or alkyl, the benzene ring B may contain substituents, and m is 2 or 3; and the use of the said dyestuffs for colouring synthetic textile materials.

3,580,947
METHOD OF RETARDING POLYMERIZATION IN THE PROCESS FOR THE PRODUCTION OF METHACRYLIC ACID ESTERS
Masashi Ikeda and Masayoshi Inoue, Ohtake-shi, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan
No Drawing. Filed Oct. 26, 1967, Ser. No. 678,207
Claims priority, application Japan, Oct. 26, 1966, 41/70,254
Int. Cl. C07c *69/54*
U.S. Cl. 260—486R **9 Claims**

A method of retarding polymerization in the process for the production of methacrylic acid esters by the reaction of acetone cyanhydrin or methacrylonitrile with sulfuric acid or fuming sulfuric acid and alcohol, said method being characterized by using as a polymerization-retarder a compound having in its molecular structure an organic ring system represented by



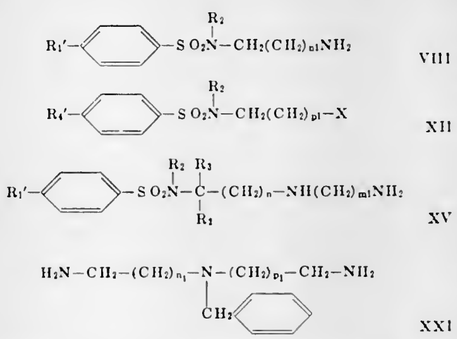
wherein X stands for sulfur, oxygen or nitrogen atom.

3,580,948
1,1-DICHLORO-1-NITROETHANE DERIVATIVES
Leo R. Morris, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.
No Drawing. Filed Aug. 1, 1968, Ser. No. 749,317
Int. Cl. C07c *69/22, 79/12*
U.S. Cl. 260—487 **4 Claims**

Disclosed are, as new compounds, α-(2,2-dichloro-2-nitroethyl)styrene, (1,3,3-trichloro-3-nitropropyl)benzene, and lower alkyl 2,4,4-trichloro-2-methyl-4-nitrobutyrates which are useful as pesticides.

3,580,949
N,N'-BIS-(AMINOALKYL)-BENZYL-AMINES
Vsevolod Gruenman, Montclair, Max Hoffer, Nutley, Jay Philip O'Brien, Irvington, and Albert Israel Rachlin, Verona, N.J., and Gerhard Zbinden, Cambridge, England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
No Drawing. Original application Mar. 19, 1965, Ser. No. 441,333, now Patent No. 3,382,260, dated May 7, 1968. Divided and this application Nov. 13, 1967, Ser. No. 682,522
Int. Cl. C07c *87/28*
U.S. Cl. 260—570.5 **2 Claims**

N,N[1] - (iminodialkylene)benezenesulfonamides, N,N[1]-(alkylenediiminodialkylene)benzenesulfonamides and derivatives thereof, effective against tachycardia and arrhythmia in both auricular and ventricular tissues, are prepared, for example, from an intermediate of the formula



wherein R_1' and R_4' are hydrogen, lower alkyl, protected amino group or amino group precursor; R_2 and R_3 are hydrogen or lower alkyl; X is chlorine or bromine; n_1 and p_1 are each 2 or 3; N is from 1 to 3, and m_1 is from 2 to 4.

3,580,950
CHELATING COMPOSITIONS BASED ON CHELATING ACIDS AND AMINES
Frederick C. Bersworth, 120 Washington St., East Orange, N.J. 07017
Continuation-in-part of applications Ser. No. 580,829, Sept. 20, 1966, now Patent No. 3,351,758, and Ser. No. 588,224, Oct. 20, 1966, now abandoned, and a continuation of application Ser. No. 468,182, June 4, 1965, now abandoned, which is a continuation of applications Ser. No. 446,120, Apr. 6, 1965, and Ser. No. 466,090, June 24, 1965, now abandoned, which in turn is a continuation-in-part of applications Ser. No. 88,604, Feb. 13, 1961, now abandoned, and Ser. No. 88,606, Feb. 13, 1961, now abandoned. This application Nov. 1, 1967, Ser. No. 679,626
Int. Cl. C07c *101/26*
U.S. Cl. 260—534 **5 Claims**

Chelating acids based on the synthetic polyamino polycarboxylic acids are reacted with amino compounds, such as ethylene diamine, ethanolamine, hexamethylene diamine, and polyamines of such linear structure to form reaction products carrying amino structures in relation to the synthetic amino acid starting material, such that effective chelators for iron and other transition metals are formed.

3,580,951
PREPARATION OF FLUOROANILINES
John W. Churchill and Ehrenfreid H. Kober, Hamden, Peter H. Scott, Guilford, and Curtis P. Smith, Cheshire, Conn., assignors to Olin Mathieson Chemical Corporation
No Drawing. Filed Jan. 10, 1969, Ser. No. 790,444
Int. Cl. C07c *85/10*
U.S. Cl. 260—580 **6 Claims**

Fluoroanilines are prepared by the deoxygenation and hydrofluorination of the corresponding nitrobenzenes which are reacted in anhydrous hydrogen fluoride and in an atmosphere of carbon monoxide at 0° to 230° C. under pressures of from 15 to 3000 p.s.i.a. in the presence of certain deoxygenating agents containing phosphorus or sulfur.

3,580,952
PROCESS FOR PURIFYING POLYETHER AMINES
Albrecht Moschel, Kelkheim, Taunus, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed Jan. 11, 1968, Ser. No. 697,016
Claims priority, application Germany, Jan. 18, 1967, F 51,273
Int. Cl. C07c *89/04*
U.S. Cl. 260—584 **3 Claims**

A process for purification of polyether amines by removing oxides, salts or complex compounds of nickel or cobalt therefrom, which comprises stirring 1 to 500 percent by volume of a lower alkanol and 0.05 to 10 percent by volume of water into the crude product, adding an inert solid drying agent, filtering off the solid substances, removing the alkanol, and heating the product until the weight remains constant.

3,580,953
PREPARATION OF 3 - ENDO-METHYL - 3-EXO(4'-METHYL-5'-HYDROXYPENTYL) NORCAMPHOR FROM 2-METHYL-4-PENTENOL
Wayne I. Fanta and William F. Erman, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Mar. 29, 1968, Ser. No. 717,362
Int. Cl. C07c *49/27*
U.S. Cl. 260—586R **14 Claims**

Process for preparing 3-endo-methyl-3-exo(4'-methyl-5'-hydroxypentyl)norcamphor from 2-methyl-4-pentenol

comprising the steps of: (1) esterifying 2-methyl-4-pentenol; (2) hydrobrominating the ester in the presence of a free radical catalyst; (3) reducing the hydrobrominated ester to 2-methyl-5-bromopentanol; (4) borating the 2-methyl-5-bromopentanol with boric acid and/or boric anhydride to obtain tri(2-methyl-5-bromopentyl)borate; and (5) alkylating 3-methylnorcamphor with the tri(2-methyl-5-bromopentyl)borate and, subsequently, hydrolyzing the reaction product to obtain 3-endo-methyl-3-exo-(4'-methyl-5'-hydroxypentyl) norcamphor.

3,580,954
PREPARATION OF 3 - ENDO-METHYL - 3-EXO-(4'-METHYL-5'-HYDROXYPENTYL) NORCAMPHOR FROM 2-METHYL-4-PENTENOL
Wayne I. Fanta and William F. Erman, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed Mar. 29, 1968, Ser. No. 717,374
Int. Cl. C07c *49/27*
U.S. Cl. 260—586R **14 Claims**

Process for preparing 3-endo-methyl-3-exo(4'-methyl-5'-hydroxypentyl)norcamphor from 2-methyl-4-pentenol comprising the steps of (1) borating 2-methyl-4-pentenol with boric acid and/or boric anhydride to obtain tri(2-methyl-4-pentenyl)borate; (2) hydrobrominating the tri (2-methyl-4-pentenyl)borate in the presence of a free radical catalyst and, subsequently, hydrolyzing the reaction product to obtain 2-methyl-5-bromopentanol; (3) etherifying 2-methyl-5-bromopentanol with dihydropyran to obtain 2-methyl - 5 - bromopentyl tetrahydropyranyl ether; (4) alkylating 3-methylnorcamphor with the 2-methyl-5-bromopentyl tetrahydropyranyl ether to obtain tetrahydropyranyl ether of 3-endo-methyl - 3 - exo(4'-methyl-5'-hydroxypentyl)norcamphor; and (5) treating tetrahydropyranyl ether of 3-endo-methyl - 3 - exo(4'-methyl - 5' - hydroxypentyl)norcamphor with p-toluenesulfonic acid or hydrochloric acid to obtain 3 - endo-methyl-3-exo(4'-methyl-5'-hydroxypentyl)norcamphor.

3,580,955
AUTO-OXIDATION OF ALDEHYDES IN THE PRESENCE OF ACYLATING AGENTS
Richard Anthony Bafford, Tonawanda, N.Y., assignor to Pennwalt Corporation
No Drawing. Filed Apr. 18, 1968, Ser. No. 722,166
Int. Cl. C07c *73/02*
U.S. Cl. 260—610 **5 Claims**

Peroxy compounds are prepared by reacting free-oxygen, an aldehyde, an organic compound containing active halogen and an acid acceptor, under anhydrous conditions, at a temperature below the decomposition temperature of the desired acylperoxy product.

3,580,956
HYDROXYLATION OF AROMATIC COMPOUNDS
Herman S. Bloch, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Nov. 3, 1967, Ser. No. 680,311
Int. Cl. C07c *37/00, 39/00, 39/06*
U.S. Cl. 260—621 **9 Claims**

The hydroxylation of an aromatic compound wherein an aromatic compound is reacted with hydrogen peroxide in contact with an acidic crystalline aluminosilicate catalyst at hydroxylation conditions. The aromatic compound is employed in molar excess with respect to hydrogen peroxide, and the catalyst contains a rare-earth metallic component.

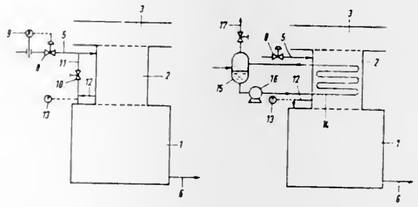
3,580,957
PREPARATION OF TETRAFLUOROETHYLENE ETHYLENES
Herman S. Bloch, Skokie, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.
No Drawing. Filed Aug. 6, 1969, Ser. No. 848,104
Int. Cl. C07c *21/18*
U.S. Cl. 260—653.5 **10 Claims**

Tetrahalo-substituted ethylenes in which all of the halo substituents are identical halogens may be prepared by treating a mixed hexahalo ethane in which at least four of the halogen substituents are identical with a free radical generating catalyst at elevated temperatures in the presence of a hydrocarbon solvent. The tetrahalo-substituted ethylenes are useful as starting materials for the preparation of polymeric substances.

3,580,958
PROCESS FOR THE PRODUCTION OF ACETYLENE
Herbert Baader, Hermulheim, near Cologne, and Kurt Sennewald, Knapsack, near Cologne, Germany, assignors to Knapsack Aktiengesellschaft, Knapsack, near Cologne, Germany
No Drawing. Continuation of application Ser. No. 634,667, Apr. 28, 1967. This application Nov. 3, 1969, Ser. No. 871,595
Claims priority, application Germany, June 1, 1966, K 59,410
Int. Cl. C07c *11/24*
U.S. Cl. 260—679 **6 Claims**

Acetylene is produced by subjecting a dihalogenoethane and/or a vinyl halide to dehydrohalogenation comprising passing the dihalogenoethane and/or the vinyl halide at a temperature between 400 and 850° C. over a catalyst formed of chlorides of the metals comprising lithium, beryllium, magnesium, calcium, strontium, barium, cerium, antimony, copper, silver, gold, zinc, cadmium, mercury, titanium, chromium, manganese, iron, cobalt, nickel, palladium and platinum, the chlorides being used alone or in combination and being deposited on a carrier, if desired.

3,580,959
PROCESS AND APPARATUS FOR PROCESS CONTROL IN CRACKING FURNACES FOR THE THERMAL CRACKING OF HYDROCARBONS
Armin Dorner, Munich, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany
Filed Oct. 12, 1967, Ser. No. 674,965
Claims priority, application Germany, Oct. 12, 1966, P 15 68 966.4
Int. Cl. C07c *3/30;* **C07g** *9/14, 9/20*
U.S. Cl. 260—683 **5 Claims**



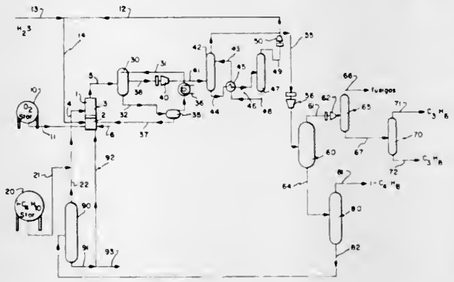
In cracking furnaces for hydrocarbons, having two heating zones—a radiation zone heated by combustion gases, and a convection zone heated by flue gases, the improvements of limiting the extent of preheating of the feed in the convection zone by: (A) water-cooled cooling coils in the convection zone; or (B) by passing a portion of the flue gases around the convection zone; or passing

only a portion of the feed into the convection zone and mixing said portion with cold feed before entering the combustion zone.

3,580,960
DEHYDROGENATION CATALYST
Ian Montgomery Keen, Wealdstone, Harrow, Peter James Craig, Sunbury, and Christopher Patrick Cadman Bradshaw, Hampton, England, assignors to The British Petroleum Company Limited, London, England
No Drawing. Filed June 18, 1969, Ser. No. 834,557
Claims priority, application Great Britain, July 29, 1968, 35,992/68
Int. Cl. B01j *11/08;* **C07c** *5/18*
U.S. Cl. 260—683.3 **21 Claims**

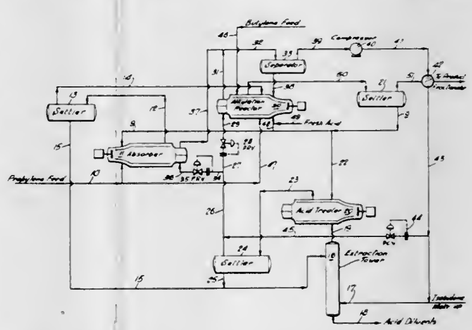
Dehydrogenation catalyst, suitable for the dehydrogenation of alkanes to alkenes, is prepared by ion exchanging a platinum group metal onto a felspar support, preferably albite.

3,580,961
PROCESS FOR PREPARING ISOBUTENE AND THE APPARATUS THEREFOR
Eugene D. Guth, Palos Verdes Estates, Jerry L. Lewis, Cypress, and Leslie J. Van Nice, Manhattan Beach, Calif., assignors to TRW Inc., Redondo Beach, Calif.
Filed July 22, 1969, Ser. No. 843,370
Int. Cl. C07c *5/18, 3/00*
U.S. Cl. 260—683.3 **35 Claims**



This invention relates to a continuous process for preparing an olefin product comprising prevailing amounts of isobutene and the apparatus therefor under substantially adiabaic conditions. Specifically, the process comprises the oxidation of at least one sulfur-containing compound e.g. hydrogen sulfide in the oxidation-reaction zone of a substantially adiabatic reactor, at temperatures ranging up to about 4500° F. and at pressures ranging up to about 1500 p.s.i.a. The oxidation-reaction products passing from the oxidation-reaction zone of said reactor are brought in direct contact and mixed with hydrocarbons containing a substantial amount of isobutane. The isobutane is converted to isobutene in the dehydrogenation-reaction zone of the same reactor. The dehydrogenation of the isobutane is carried out in the presence of the oxidation-reaction products at mixing temperatures which may range up to about 4500° F., at pressures ranging up to about 1400 p.s.i.a. and for a contact or reaction time ranging up to about 60 seconds. The reactor wherein the reactions take place comprises a substantially cylindrical vessel having a plurality of reaction zones. The first of said reaction zones comprises means for receiving combustible materials and is substantially surrounded by a coolant. The second of said reaction zones is insulated and has means for controlling the relative pressures between the first and second zones. The reactor has on its outer periphery means for carrying hydrocarbons into the area of the dehydrogenation zone wherein said hydrocarbons are converted to olefins.

3,580,962
ALKYLATION PROCESS EMPLOYING FLASH VAPORIZATION OF EXTRACTED AND ACID-TREATED ABSORPTION PRODUCT
Henry D. Moorer, Richmond, Va., Ralph M. Lewis, Weston, Conn., and Richard W. Stokeld, Jr., Wappingers Falls, N.Y., assignors to Texaco Inc., New York, N.Y.
Filed June 30, 1969, Ser. No. 837,791
Int. Cl. C07c *3/54*
U.S. Cl. 260—683.62 **6 Claims**



Method for refrigeration of a sulfuric acid alkylation process operated in conjunction with an associated acid recovery process involving reacting used acid with olefin feed in an absorber, extracting resulting dialkyl sulfates, acid treating the extract solution and passing the treated solution to alkylation. The acid treated extract solution is vaporized and passed in indirect exchange with contents of absorber and alkylation reactor. Vaporized isobutane may be separated, recompressed, cooled and returned as a liquid for combination with the acid treated extract stream for additional cooling capacity.

3,580,963
VAPOR DEPOSITED METAL POLYESTER POLYCONDENSATION CATALYSTS
Herbert Kurzke, Bobingen, Wolfgang Goltner, Kriftel, Taunus, and Walter Seifried, Wiesbaden, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Continuation of application Ser. No. 481,396, Aug. 20, 1965. This application Aug. 1, 1969, Ser. No. 849,578
Claims priority, application Germany, Aug. 22, 1964, F 43,809
Int. Cl. C08g *17/015, 39/10*
U.S. Cl. 260—860 **4 Claims**

A process has been provided for dispersing solids in a liquid or a melt by combining a solid to be dispersed with a solid organic carrier which is soluble in the liquid or melt and introducing the combination of the solid and the solid organic carrier material into the liquid or melt whereby the solid organic carrier material is dissolved, and thereby the solid is accordingly dispersed in the liquid or melt.

3,580,964
CURABLE LINEAR POLYESTERS
Gary L. Driscoll, Boothwyn, Pa., assignor to Sun Oil Company, Philadelphia, Pa.
No Drawing. Continuation-in-part of abandoned application Ser. No. 629,376, Apr. 10, 1967. This application Sept. 6, 1967, Ser. No. 665,711
Int. Cl. C08g *17/10, 17/12;* **C08f** *21/02*
U.S. Cl. 260—871 **21 Claims**

Curable polyesters containing an adamantane moiety are prepared in one- or two-stage condensation type reactions. The polyesters are prepared from a hydrocarbon

substituted adamantane diol and anhydride of unsaturated diacids such as maleic acid alone or with a second diol such as ethylene glycol. In addition to the anhydrides of unsaturated diacids, the polyester can contain saturated diacid moieties. The polyesters so prepared can be crosslinked with a conventional crosslinking agent and curable polymer can be cast into sheets or films and cured. The curable blend can be used as a coating and cured in place to give chemical-resistant surfaces. The crosslinked polymers exhibit extremely good hydrolytic and solvent stability with good heat and ultraviolet stability.

3,580,965
THERMOPLASTIC POLYESTER MOLDING COMPOSITIONS CONTAINING OLEFIN-VINYL ESTER COPOLYMERS
Ludwig Brinkmann, Frankfurt am Main, Harald Cherdron, Wiesbaden, and Walter Herwig, Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany
No Drawing. Filed July 11, 1968, Ser. No. 743,946
Claims priority, application Germany, July 18, 1967, F 52,991
Int. Cl. C08g *39/04*
U.S. Cl. 260—873 **11 Claims**

Molding compositions which can be processed thermoplastically are prepared from a mixture of linear saturated polyesters and α-olefin-vinyl ester copolymers and are distinguished by a high impact strength.

3,580,966
GRAFT COPOLYMERS OF ACRYLONITRILE ONTO A LINEAR POLYETHER HAVING QUATERNISED NITROGEN ATOMS
Helmut Engelhard, Leverkusen, Francis Bentz, Cologne, and Heinrich Rinkler and Günther Nischk, Dormagen, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany
No Drawing. Filed Dec. 26, 1968, Ser. No. 787,222
Claims priority, application Germany, Jan. 4, 1968, P 17 20 771.5
Int. Cl. C08f *29/56*
U.S. Cl. 260—898 **6 Claims**

The invention relates to an acrylonitrile graft polymer having improved affinity for acid dyes comprising acrylonitrile being graft-polymerised together with other acrylic or vinyl monomers and a linear polyether having quaternised nitrogen atoms as graft base. The graft base has a molecular weight of about 1,000 to about 15,000 and the acrylonitrile graft polymer has a K-value (according to Fikentscher, Cellulose Chemie 13, (1932), page 58) of from 70 to 100. In the process of preparing said acrylonitrile graft polymer acrylonitrile and other copolymerisable comonomers are graft-polymerised in the presence of a graft base consisting of a linear polyether having quaternised nitrogen atoms.

3,580,967
SUBSTITUTED 2-AMINOMALONAMIDES PRODUCTION
John R. Norell, Bartlesville, Okla., assignor to Phillips Petroleum Company
No Drawing. Continuation-in-part of application Ser. No. 560,859, June 27, 1966. This application Jan. 31, 1969, Ser. No. 795,676
Int. Cl. C07c *103/33*
U.S. Cl. 260—557 **8 Claims**

Production of 2-aminomalonamides having hydrocarbyl substituents, which amides are useful as pharmaceutical and agricultural chemicals, antiplasticizers, processing aids and the like, by the reaction of olefins, hydrogen cyanide and anhydrous hydrogen fluoride followed by hydrolysis.

3,580,968
PROCESS FOR PREPARING N,N-DIALKYL-ACYLAMIDES
Michio Kuraishi, Setunobu Asano, and Nobuo Isogai, Niigata-shi, Japan, assignors to Japan Gas-Chemical Company, Inc., Tokyo, Japan
No Drawing. Filed Apr. 30, 1969, Ser. No. 820,617
Claims priority, application Japan, May 9, 1968, 43/31,096
Int. Cl. C07c *103/00*
U.S. Cl. 260—561R **6 Claims**

N,N-dimethylacylamides are prepared with commercial advantages by reacting trimethylamine with lower fatty acids or esters thereof or compounds capable of forming said acids or esters by reaction with carbon monoxide at elevated temperatures and under high pressures and in the presence of metal carbonyls, e.g. aliphatic alcohols and ethers, and with carbon monoxide at elevated temperatures and under high pressures in the presence of metal carbonyls either singly or in combination with halogens or halogen compounds.

3,580,969
DEHYDROGENATION OF OLEFINS
George J. Nolan and Vernon C. F. Holm, Bartlesville, Okla., assignors to Phillips Petroleum Company
No Drawing. Filed Jan. 8, 1968, Ser. No. 696,146
Int. Cl. C07c *5/18*
U.S. Cl. 260—666 **4 Claims**

Improvements in hydrocarbon dehydrogenation are realized by the use of a catalyst comprising tin and/or a tin compound supported on an aluminum phosphate.

3,580,970
DEHYDROGENATION OF CYCLOALIPHATIC KETONES AND ALCOHOLS
Harold E. Swift, Gibsonia, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
Continuation-in-part of application Ser. No. 506,479, Nov. 5, 1965. This application Nov. 22, 1967, Ser. No. 689,233
Int. Cl. C07c *39/00, 39/02, 39/12*
U.S. Cl. 260—621H **9 Claims**

Cycloaliphatic ketones and alcohols are dehydrogenated to the corresponding hydroxyaromatic compounds at elevated temperatures in the presence of a novel nickel-tin catalyst.

3,580,971
THIXOTROPIC ORGANOPOLYSILOXANE COMPOSITIONS HAVING PENDANT METHACRYLIC ACID POLYMER
John Charles Getson, Tecumseh, Mich., assignor to Stauffer-Wacker Silicone Corporation, Adrian, Mich.
No Drawing. Filed Aug. 13, 1969, Ser. No. 849,920
Int. Cl. C08g *47/10*
U.S. Cl. 260—825 **6 Claims**

Polymethacrylic acid graft modified siloxanes which exhibit thixotropic properties.

3,580,972
COATING COMPOSITION OF A MIXTURE OF A VINYL ESTER OF AN ALIPHATIC ACID-CARBOXYLIC ACID COPOLYMER AND A TERPOLYMER OF A VINYL ESTER OF AN ALIPHATIC ACID, A CARBOXYLIC ACID ESTER AND A CARBOXYLIC ACID
Robert A. Isaksen, Longmeadow, and Robert V. De Shay, East Longmeadow, Mass., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Continuation-in-part of application Ser. No. 617,453, Feb. 21, 1967. This application Aug. 7, 1969, Ser. No. 848,354
Int. Cl. C08g *45/04;* **C08f** *29/50*
U.S. Cl. 260—836 **12 Claims**

A first interpolymer of 0.5 to 10 mol percent of an ethylenically unsaturated mono- or poly-carboxylic acid and 99.5 to 90 mol percent of a vinylidene ester of a saturated aliphatic acid is blended with a second interpolymer which acts as a polymeric plasticizer. Preferably, the first interpolymer is a copolymer of vinyl acetate and crotonic acid. The second interpolymer is comprised of 75 to 95 mol percent of a vinylidene ester of a saturated aliphatic acid (principally vinyl acetate), 5 to 25 mol percent of an ethylenically unsaturated mono- or polycarboxylic acid having at least 75% of its carboxylic acid groups esterified with an aliphatic alcohol (principally dibutyl maleate), 0.5 to 10 mol percent of an ethylenically unsaturated mono- or poly-carboxylic acid (principally acrylic acid), and, optionally, zero to 3 mol percent of a glycidyl ester of an ethylenically unsaturated mono- or poly-carboxylic acid (principally glycidyl methacrylate). The interpolymer blend is useful for the protection of materials having at least one finished surface. When no longer needed, it may be removed from the substrate by washing with an aqueous alkaline solution.

3,580,973
POLYOXYMETHYLENE-FORMAL-CONTAINING POLYESTER BLOCK POLYMER
Daniel M. Kennedy, Jr., East Brunswick, and Carl Naeber Zellner, Berkeley Heights, N.J., assignors to Celanese Corporation, New York, N.Y.
No Drawing. Filed Dec. 18, 1967, Ser. No. 691,160
Int. Cl. C08g *17/06, 39/10, 51/58*
U.S. Cl. 260—860 **8 Claims**

A novel process for the production of stabilized oxymethylene polymers is presented wherein a polyoxymethylene-polyester block polymer is prepared by reacting a linear, formal-containing polyester with trioxane under trioxane polymerization conditions.

3,580,974
NITRILE POLYMERIC BLENDS
Yoon Chai Lee and Quirino A. Trementozzi, Springfield, Mass., assignors to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Jan. 3, 1969, Ser. No. 788,963
The portion of the term of the patent subsequent to June 24, 1986, has been disclaimed
Int. Cl. C08f *37/18, 41/12*
U.S. Cl. 260—876R **8 Claims**

A polymeric blend is prepared from an acrylonitrile/isobutylene copolymer and a methacrylonitrile/isobutylene copolymer. The processing characteristics of the blend are very good, as is the balance of chemical and physical properties exhibited thereby.

3,580,975
VINYL HALIDE GRAFT POLYMERS
Leo E. Rademacher, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.
No Drawing. Filed Sept. 21, 1967, Ser. No. 669,372
Int. Cl. C08f *15/00*
U.S. Cl. 260—878 **13 Claims**

There is disclosed a process for preparing novel graft polymers of a vinyl halide and long-chain aliphatic vinyl compound on a rubbery olefin polymer. In accordance with the process, an aqueous dispersion is formed of a rubbery olefin polymer and a monomer formulation containing vinyl halide and a copolymerizable long-chain aliphatic vinyl monomer. Polymerization is effected in the resulting dispersion for a period of time sufficient to polymerize at least a substantial portion of the vinyl halide and aliphatic vinyl monomer present therein and produce grafting of at least a portion of the rubbery olefin polymer after which the copolymeric product is recovered. In the preferred process the faster reacting monomer is continuously added so as to maintain a higher ratio of the slower acting monomer in the dispersion.

ELECTRICAL

3,580,976

DEVICE FOR REGULATING THE TEMPERATURE OF GLASS AT THE OUTLET OF A VERY HIGH TEMPERATURE GLASS MELTING FURNACE

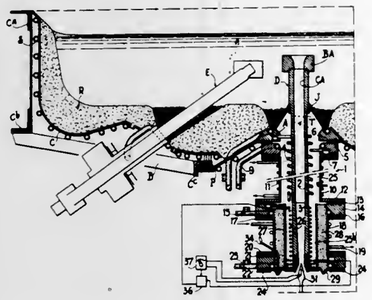
Jacques Marie Yves le Clerc de Bussy, Aumatres, 80 Oisemont, France

Filed Jan. 26, 1970, Ser. No. 5,569

Claims priority, application France, Jan. 28, 1969, 6901615

Int. Cl. C03b *5/26, 5/30*

U.S. Cl. 13—6 **12 Claims**



The regulating device provides at its outlet a glass whose temperature is adapted to the use of conventional feeders, notwithstanding the very high temperature prevailing in the furnace with which the device is associated. The glass flows through an extension which is surrounded by an enclosure which has, first, a heat-permeable wall for cooling the glass and, then, a heat-impermeable wall. A resistance corrects the temperature of the glass in the outlet by means of a control loop.

3,580,977

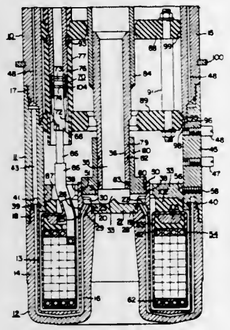
QUICK-CHANGE FIELD COIL ASSEMBLY FOR USE IN AN ELECTRODE HAVING A FLUID-COOLED ARCING SURFACE

George A. Kemeny, Export, and Charles B. Wolf, Irwin, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 777,366, Nov. 20, 1968, now abandoned. This application Feb. 18, 1970, Ser. No. 12,269

Int. Cl. H05b *7/06, 7/10, 7/12*

U.S. Cl. 13—18 **19 Claims**



An electrode has a detachable tip secured to a supporting column. The column includes fluid-channeling and electrically conducting tubes, electrically insulated from each other, extending at least a portion of the way therethrough toward the tip. Within the removable tip is a detachable magnetic field coil assembly including conduit extensions which, when the coil assembly is inserted in the electrode, are aligned with the tubes respectively. Male fittings engage contact finger assemblies and make good electrical connection. The fittings may be on the tubes and the contact finger assemblies may be on the conduit extensions, or the fittings may be on the conduit extensions and the contact finger assemblies may be secured to the ends of the tubes. Means carried by the column, or the conduit extensions including fittings or finger assemblies thereon, or both, provide fluid-tight seals for the cooling fluid flow circuit through the magnetic field coil.

3,580,978

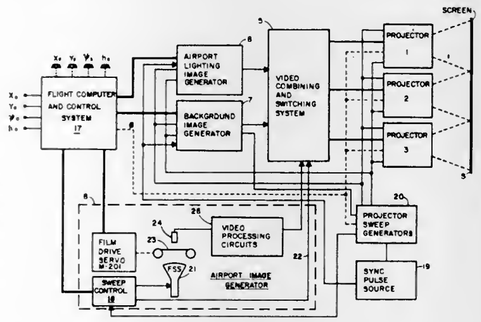
VISUAL DISPLAY METHOD AND APPARATUS

William C. Ebeling, Binghamton, N.Y., assignor to Singer-General Precision, Inc., Binghamton, N.Y.

Filed June 6, 1968, Ser. No. 735,109

Int. Cl. G09b *9/02;* **G06g** *7/72*

U.S. Cl. 35—10.2 **46 Claims**



Apparatus for generating a realistic wide-screen visual display for an aircraft simulator with realistic perspective throughout plural widely different phases of simulated flight by scanning a plurality of different successive types of transparencies with a flying spot scanner to derive video signals to drive television display projectors, including the scanning of a pair of transparencies to provide a background terrain elevation image without topographical features, scanning of a second type of transparency to provide an image of an airport or the like to be inset into the background image and distorting the inset image as simulated range and elevation angle from the airport vary, scanning a third type of transparency to provide a different type of inset image during simulated approach and landing and distorting that inset image in accordance with deviation of the simulated aircraft from a reference glideslope, and scanning a fourth type of transparency to provide a panoramic view of the airport during simulated taxiing and parking maneuvers, with means for automatically controlling the successive scanning modes with signals from a flight computer.

3,580,979

ELECTRONIC MUSICAL KEYER WITH TOUCH RESPONSIVE VOLUME CONTROL EMPLOYING A MECHANICAL ELECTRICAL TRANSDUCER

Hiroshi Amano, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Nakazawa-cho, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Aug. 8, 1969, Ser. No. 848,544

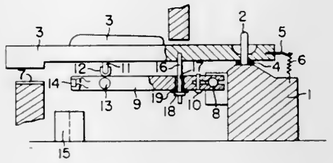
Claims priority, application Japan, Aug. 13, 1968, 43/57087

Int. Cl. G10h *3/00;* **G10c** *3/12;* **G10b** *3/12*

U.S. Cl. 84—1.1 **4 Claims**

A keyboard device for an electronic musical instrument comprising a plurality of keys, a lever located under each of

the keys, the lever being swingably supported at one end by a pivot shaft and provided with a weight at the other free end, a mechanical-electrical transducer including a movable magnetic sensor attached to the free end of the lever and a fixed magnet disposed in such position that the magnet applies varied effects on the sensor depending on the relative posi-



tions thereof, a drive member fixed on the key to transmit the depression of the key to the lever, and a bridle rod fixed to the key to return the lever when the key is released, the lever being provided in relation to the pivot shaft with sufficient friction force to hold the lever in a depressed position in accordance with the key depressing strength.

3,580,980

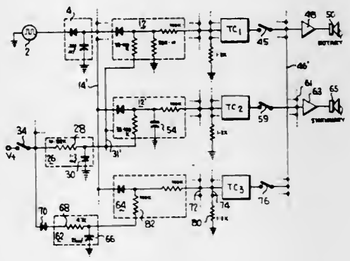
DIODE KEYING SYSTEM FOR ELECTRONIC ORGAN

Dale M. Uetrecht, Cincinnati, Ohio, assignor to D. H. Baldwin Company, Cincinnati, Ohio

Filed Aug. 26, 1968, Ser. No. 755,043

Int. Cl. G10h *1/06*

U.S. Cl. 84—1.22 **32 Claims**



The keying networks between continuously running square wave tone signal sources and the sound output system of an electronic organ each consist of an isolating diode gate for each source, followed by the parallel combination of at least two keying diode gates of simplified circuitry which either gate-through the square wave signal without change in wave shape (for odd-order-harmonic tones) or gate-through and modify the wave-shape into sawtooths (for full harmonic tones). A keyed activating circuit for the isolating diode gate and the keying diode gates corresponding to a selected key may contain a single key switch connected to a source of direct current and a common R–C attack network for two adjacent footage keying diode gates as well as for the paralleled keying diode gates. A common coupler switch for coupling between keyboards is located between the direct current source and auxiliary key switches ganged respectively to the main key switches for a given manual, the auxiliary key switches being connected to a diode to isolate them from the main key switches in the coupled keyboard.

ERRATUM

For Class 174—10 see:
Patent No. 3,579,863

3,580,981

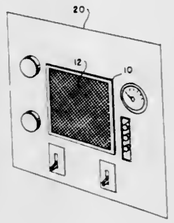
ELECTRICALLY CONDUCTIVE VENTILATING PANEL

Richard W. Lamp, Mendham; Joseph E. Kopf, Cranford; Donald P. Dravis, Roselle, and Robert A. Cuneo, Bergenfield, N.J., assignors to Technical Wire Products, Inc., Cranford, N.J.

Filed Oct. 14, 1969, Ser. No. 866,332

Int. Cl. H05h *9/00*

U.S. Cl. 174—35 **12 Claims**



A framed electrically conductive honeycomb is provided by assembling an electrically conductive honeycomb, an electrically conductive frame for the honeycomb and an electrically conductive textile positioned between the frame and around the periphery of the outer cells of the honeycomb and in contact with both, and then coating the assembly in a metal plating bath to coat the assembly with a coating of an electrically conductive compound thereby assuring continuous mechanical, strong physical and electrical contact between the frame and the honeycomb, as well as a noncorrosion coating.

3,580,982

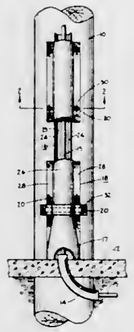
POLE RISER GUARD—BACK-UP PLATE COMBINATION

Jamshed Behram Havewala, Newark, Del., assignor to Haveg Industries, Inc., Wilmington, Del.

Filed Dec. 22, 1969, Ser. No. 887,135

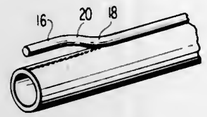
Int. Cl. H02g *7/20*

U.S. Cl. 174—45 **8 Claims**



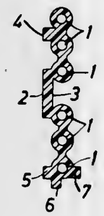
A pole riser guard and backup plate combination which is attached to a power pole and surrounds electrical cable. The backup plate is generally channel-shaped and is secured to the pole and the guard extends over the backup plate and receives the backup plate therein whereby the cable is protected by the backup plate from instruments inserted between the guard and the pole.

3,580,983
CONDUCTIVE LINE TUBE
Isaac S. Jackson, Greenwich, N.Y., assignor to National Catheter Corp., Argyle, N.Y.
Filed Dec. 3, 1969, Ser. No. 881,750
Int. Cl. F16l *11/12;* **H05f** *3/02*
U.S. Cl. 174—47 **10 Claims**



The fabrication of conductive line tubing or electrically conductive medicosurgical tubes by extruding from a mass of flexible plastic material an elongated tube contemporaneous with the extrusion of an elongated electrically conductive plastic filament that is secured to said tube in superimposed relationship piggyback arrangement. The plastic material used to form the conductive line tubes is compounded from dielectric polymers while the filament is formed from a flexible electrically conductive plastic material. The extrusion of the tube and filament is continuous with the filament being secured to the tube subsequent to its withdrawal from an extrusion die.

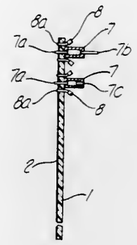
3,580,984
SURFACE WIRING SYSTEMS
Knut Arnold Oscar Gladh, Sodertalje, Sweden, assignor to Gladol S.A., Geneva, Sweden
Filed Dec. 12, 1968, Ser. No. 783,314
Claims priority, application Sweden, Dec. 13, 1967, 17,105/67
Int. Cl. H02g *3/04*
U.S. Cl. 174—48 **3 Claims**



A prefabricated system for electrical installations in buildings, apartments and the like, wherein at least six aluminum conductors are embedded in a core, said core is covered by a cover means in the form of a conventional floor or ceiling molding or a conventional doorcase and jointed at at least each corner and outlet of the installation, and wherein the material of the core is of substantially uniform thickness around the aluminum conductors embedded in the core.

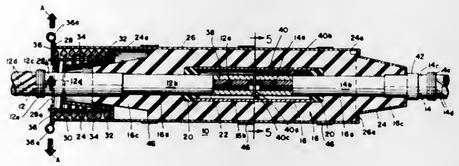
3,580,985
CABLE CONNECTOR AND MEANS TO MANUFACTURE SAME
Helmut Rothfuss, and Horst Rode, Spahnacher, both of, Germany, assignors to The Bunker-Ramo Corporation, Oak Brook, Ill.
Filed Mar. 26, 1969, Ser. No. 810,634
Claims priority, application Germany, Mar. 29, 1968, P 17 65 078.1
Int. Cl. H05k *1/08*
U.S. Cl. 174—68.5 **12 Claims**

A novel cable connector and method of fabricating same is described wherein interconnecting conductor paths are defined on a printed circuit board, the board is perforated, a plug or socket connector is inserted in the perforations, and the bare ends of feed cables are inserted into perforations adjacent the solder pins of the plug or socket connector. The entire assembly is then batch soldered, thus economically



and conveniently providing complete cable plug assemblies. A technique for rotatably mounting such completed cable plug assemblies is also described.

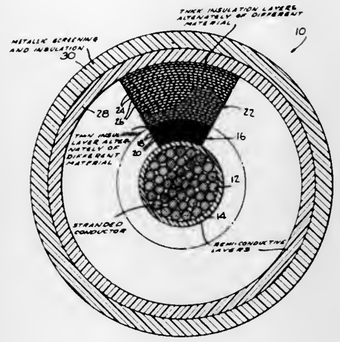
3,580,986
CORONA FREE COUPLING ASSEMBLY FOR COAXIAL CABLES
Donald O. Misare, Riverside, Ill., assignor to Joslyn Mfg. and Supply Co., Chicago, Ill.
Filed Oct. 22, 1969, Ser. No. 868,548
Int. Cl. H02g *15/08*
U.S. Cl. 174—73 **4 Claims**



A corona free coupling assembly for high voltage coaxial cable comprising an elastomeric body of insulating material having an elongated bore for receiving end portions of the cables, tubular inner shield means embedded in the body in coaxial alignment with the bore and spaced from opposite ends thereof; a tubular connector sleeve is inserted into the bore within said inner shield means for connecting the central conductors in end-to-end relation; conductive spring means is mounted on the connector sleeve including a deflectable free end portion normally biased outwardly for contact against the inner shield means embedded in the elastomeric body. The spring means is deflectable inwardly against the sleeve while being inserted into the elastomeric body with the connected cables. An outer conductive shield means is provided around the insulated elastomeric body for connecting the outer shielding systems of the cables.

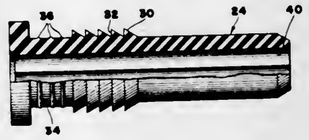
3,580,987
ELECTRIC CABLE
Paolo Gazzana Priaroggia, Milan, Italy, assignor to Pirelli Societa per Azioni, Milan, Italy
Filed Mar. 18, 1969, Ser. No. 808,240
Claims priority, application Italy, Mar. 26, 1968, Dec. 23, 1968, 14832A;25510A
Int. Cl. H01b *7/02*
U.S. Cl. 174—120 **9 Claims**

Electric cable and process for its manufacture are disclosed. The electric cable has its electric conductor covered with extruded insulation comprising numerous layers of insulating material, the number of such layers being more than two and preferably ranging between 5 and 100, and the



thickness of each of such layers being not greater than 2 mm. and preferably ranging between 0.2 and 2 mm.

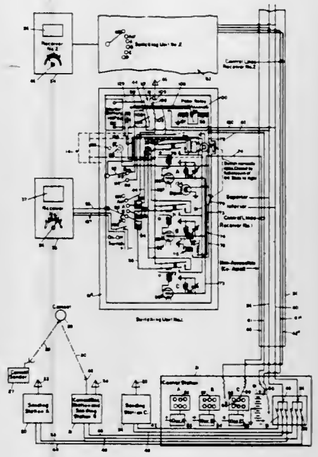
3,580,988
GROMMET FOR SPEAKER ENCLOSURE
Donald W. Orlowski, Glenview, and Donald S. Schroeder, Barrington, Ill., assignors to Ampex Corporation, Redwood City, Calif.
Filed Aug. 12, 1969, Ser. No. 849,423
Int. Cl. H01b *17/30;* **H04r** *7/16;* **F16l** *5/02*
U.S. Cl. 174—153 **4 Claims**



A resilient grommet for forming an airtight seal in an opening while permitting the airtight passage of an electrical cord through the opening. The grommet provides strain relief for the cord and is provided with a series of ribs to prevent pullout.

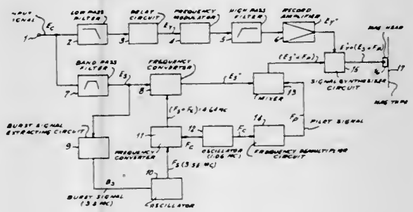
3,580,989
SUBSCRIPTION TELEVISION SYSTEM UTILIZING A TRANSMISSION LINE FOR CONDUCTING EACH AESTHETIC QUALITY TELEVISION PROGRAM
Thomas A. Banning, Jr., Apt.1408, 5500-5520 S. Shore Drive, Chicago, Ill.
Continuation-in-part of application Ser. No. 559,494, June 22, 1966, which is a continuation-in-part of application Ser. No. 490,402, Sept. 27, 1966, now Patent No. 3,478,162, which is a continuation-in-part of application Ser. No. 459,399, May 27, 1965, now Patent No. 3,365,542. This application May 19, 1967, Ser. No. 645,843
Int. Cl. H04n *1/32, 1/34*
U.S. Cl. 178—5.1 **13 Claims**

A Subscription Television System, including simultaneous coaxial transmission of several different sending station programs through an attended control station, with switching apparatus at each subscription receiver enabling the control station attendant to deliver to the subscription receiver any subscriber-selected one of said programs in subscriber-selected aesthetic rendition quality, including inferior aesthetic quality without subscription charge, or a superior quality with subscription charge; including provisions assuring against fraudulent subscription-receiver program reception in superior instead of inferior quality rendition; and to



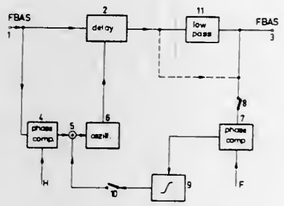
assure subscriber-receiver reception of only the selected program, in the quality instructed to the attendant.

3,580,990
RECORDING AND REPRODUCING SYSTEM FOR COLOR VIDEO SIGNALS
Toshihiko Numakura, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Nov. 13, 1968, Ser. No. 775,277
Claims priority, application Japan, Nov. 13, 1967, 42/72736
Int. Cl. H04n *9/32*
U.S. Cl. 178—5.2 **22 Claims**



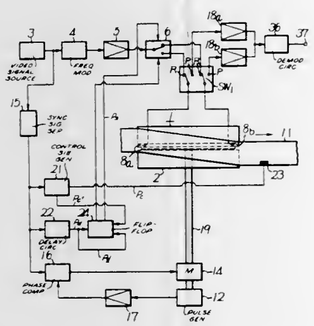
In recording a composite color video signal consisting of a luminance signal and a modulated chrominance signal having its frequency band contained within the luminance signal band, a carrier is frequency modulated with the luminance signal separated from the composite signal, the modulated chrominance signal separated from the composite original is frequency converted to have a frequency band juxtaposed to the lower limit of the bandwidth of the frequency-modulated luminance signal, and the latter is combined with the thus converted chrominance signal and with a pilot signal having a still lower bandwidth to provide a combined signal which is magnetically recorded. Upon magnetic reproduction of the combined signal thus recorded, the pilot signal, frequency-modulated luminance signal and converted chrominance signal are separately extracted from the reproduced signal, amplitude variations of the pilot signal are detected to control the amplitude of the converted chrominance signal which is reconverted to substantially its original frequency band by reference to the pilot signal, and the frequency-modulated luminance signal is demodulated and combined with the reconverted modulated chrominance signal to provide the composite color video signal.

3,580,991
AUTOMATIC TIME CORRECTION CIRCUIT FOR COLOR TV SIGNALS
Gerhard Krause, Darmstadt, Germany, assignor to Fernseh GmbH, Darmstadt, Germany
Filed Apr. 1, 1969, Ser. No. 811,989
Claims priority, application Germany, Apr. 3, 1968, P 17 74 082.8
Int. Cl. H04n *5/21, 5/78, 9/12*
U.S. Cl. 178—5.4 **7 Claims**



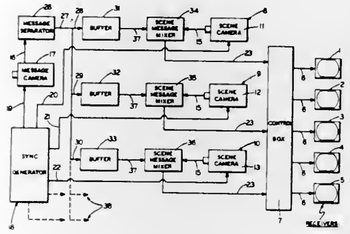
An automatic time correction circuit for color TV signals which are received from a magnetic storage device, such as a tape, in which the delayed color TV signal is compared in phase with a first reference signal, then the compared output signal is again compared with a second reference signal and, the output from the second comparator is superimposed on the output of the first comparator.

3,580,992
MULTI-HEAD MAGNETIC RECORDING AND REPRODUCING DEVICE FOR VIDEO SIGNALS FEATURING HEAD SWITCHING IN THE RECORD MODE
Yasuhito Eguchi, Tokyo; Yoshio Fujiwara, and Takaaki Tohma, Kanagawa-Ken, Japan, assignors to Sony Corporation, Tokyo, Japan
Filed June 18, 1968, Ser. No. 738,029
Claims priority, application Japan, June 19, 1967, July 22, 1967, 43/39,158; Utility 43/63,429
Int. Cl. H04m *5/78*
U.S. Cl. 178—6.6HS **6 Claims**



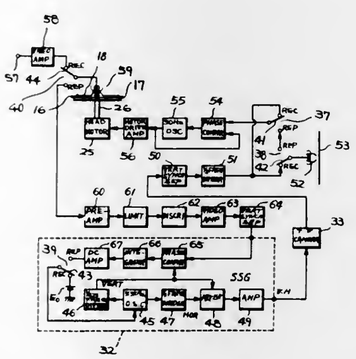
In a magnetic recording and reproducing device having two rotary magnetic heads for recording and reproducing signals, such as video signals, in skew tracks traced across a magnetic tape by the heads, a switching circuit is provided which, during recording, alternately supplies the video signals to the heads in synchronism with the vertical synchronizing pulses included in the video signals. The video signals thus recorded in successive tracks have overlapping portions which either correspond to a very short recording period of the order of one horizontal period of the video signal and are contained in the vertical blanking period of the signal, or one of such overlapping portions is recorded at a substantially lower level than the other. In reproducing the video signals thus recorded, the outputs of the heads are merely combined.

3,580,993
MULTIPLE CAMERA SUPERIMPOSED MESSAGE CLOSED CIRCUIT TELEVISION SYSTEM
Robert E. Sandorf, and Robert A. Hammond, Canton, Ohio, assignors to Diebold, Incorporated, Canton, Ohio
Filed Sept. 27, 1968, Ser. No. 763,193
Int. Cl. H04n *5/22, 7/00, 7/18*
U.S. Cl. 178—6 **4 Claims**



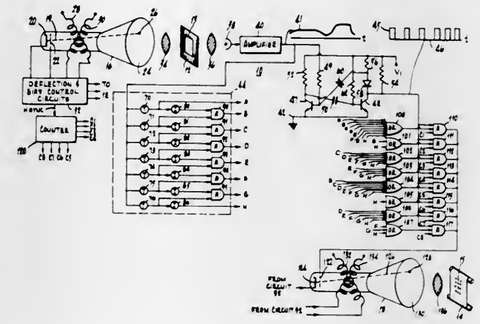
A closed circuit television system advantageously used in conducting television banking services. The system has a plurality of camera viewed teller stations and a plurality of customer stations equipped with monitors. Any teller camera may be connected selectively with one of a plurality of the monitors. A message camera viewing an advertising message from the bank is incorporated in the system so that the same message is superimposed upon any of the teller camera scenes displayed at any of the customer receivers.

3,580,994
SIGNAL EDITING SYSTEM FOR MAGNETIC RECORDING AND REPRODUCING APPARATUS
Yoshiteru Kosaka, Kamakura, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan
Filed Nov. 25, 1968, Ser. No. 778,666
Claims priority, application Japan, Nov. 27, 1967, 43/75,626; 43/75,627
Int. Cl. G11b *5/04, 27/02;* **H04n** *5/78*
U.S. Cl. 178—6.6A **2 Claims**



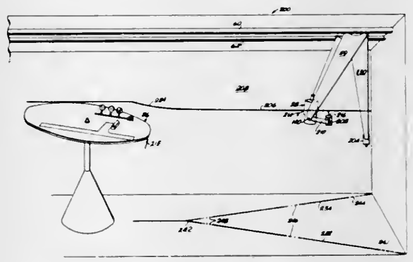
A signal editing system for magnetic recording and reproducing apparatus which records, on a magnetic tape on which one video signal is already recorded. The recording in either a second video signal from a television camera or video signals other than the second video signal, such as incoming signals of television receivers, for example. The new recording may start at a point on the magnetic tape which is halfway through the one video signal recorded thereon. The signal editing system provides means whereby the synchronizing signals of the two video signals can be brought into phase agreement with each other so that editing of the video signals can be effected without the occurrence of disturbance in synchronism.

3,580,995
CONSTANT SIZED HALFTONE DOT IMAGE GENERATOR
Richard J. Klensch, Trenton, N.J., assignor to RCA Corporation
Filed Apr. 29, 1968, Ser. No. 725,041
Int. Cl. H04m *5/84*
U.S. Cl. 178—6.7 **8 Claims**



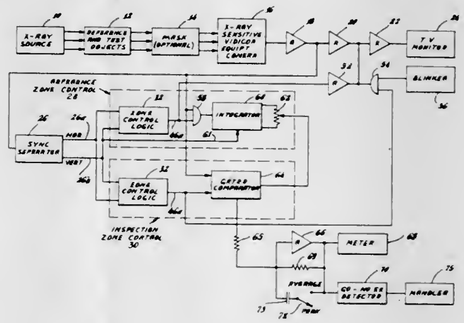
A halftone image generator that simulates the continuous tones in an original pattern by producing a plurality of visually subliminal halftone dots of substantially the same size, with the coordinate spacings between the halftone dots being made dependent upon the density of the tones in the original pattern.

3,580,996
VIDEO LANDING AND DEPARTURE SYSTEM
Edward Stanton Maxey, 921 E Ocean Blvd., Stuart, Fla.
Filed Oct. 17, 1968, Ser. No. 768,256
Int. Cl. H04n *7/18*
U.S. Cl. 178—6.8 **20 Claims**



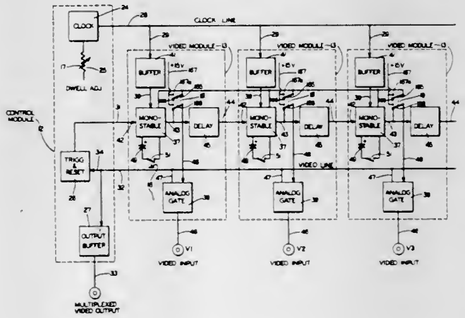
A landing and departure system for aircraft, of particular utility in making blind landings at an airport. The system incorporates a closed circuit video system which provides a video display in an aircraft of a detailed model or mockup of the airport for use by the pilot in making the blind landing. In the system, the video camera and model mockup of the airport are moved relative to each other so that the line of sight view of the model airport, as seen by the camera, is the same as the line of sight view which would appear with clear visibility through the cockpit window to the eye of the pilot. The video camera is focused on the model and is movable along a track toward or away from the model in proportion to the approach or departure of the aircraft and simultaneously the model and camera are synchronously moved on tilt and rotating axes to provide a relationship between the camera and model airport in direct proportion to the position and altitude of the aircraft relative to the airport. Means are also provided to manipulate the camera in response to actual roll, pitch and yaw of the aircraft and to vary the video image accordingly. Appropriate ground and airborne electronic control means, such as radar, radio, continuous wave system, etc. are utilized to sense and move the elements of the system. Also, information, such as actual elevation, distance to the runway and other critical information may be transmitted to the aircraft and displayed on the marginal edges of the video picture.

3,580,997
VIDEO SYSTEM FOR AUTOMATIC PRODUCTION LINE INSPECTION BY X-RAY
Thomas Alan Webb, Milford, and Jay A. Harvey, Fairfield, Conn., assignors to Balteau Electric Corporation, Stamford, Conn.
Filed July 5, 1968, Ser. No. 742,948
Int. Cl. H04n *1/38, 7/18*
U.S. Cl. 178—6.8 **26 Claims**



The disclosed system employs a television camera to convert the radiographic image produced by an irradiated test object to video signals which are processed and interpreted electronically without human interpretation. The video signals are processed to provide an indication of the radiographic density of a test object in relation to that of a reference object. When plural test objects are analyzed in succession and/or are in motion while being irradiated, a radiation mask having synchronizing and coding slots is used to coordinate the video signal processing circuitry to the scan of the TV camera.

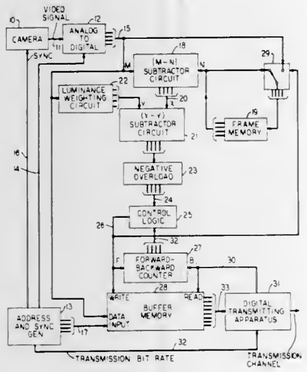
3,580,998
VIDEO MULTIPLEXER-SWITCHER WITH SEQUENCE RECYCLING UPON LOSS OF VIDEO
Robert A. Hammond, Canton, and Eugene A. Presta, Louisville, Ohio, assignors to Diebold Incorporated, Canton, Ohio
Filed Dec. 18, 1968, Ser. No. 784,619
Int. Cl. H04n *7/02, 7/08, 7/18*
U.S. Cl. 178—6.8 **5 Claims**



A plurality of television cameras such as in a closed circuit television system for industrial plant security are provided

with a monitoring system including a control module and a plurality of switching modules, one for each camera, and also a single monitoring means such as a television receiver or a video tape recorder or both, at which signals or pictures from the cameras appear sequentially. The monitoring system includes means for enabling the picture from the cameras to be displayed at the monitor successively each for a selected desired length of time; or for enabling any camera to be removed in effect from the system by pressing a button; or for enabling any selected camera to remain connected to the monitor continuously or for any desired period of time merely by the operation of pushbuttons. Flexibility is provided in the system by utilizing monostable regenerative circuits in each video switching module to determine the length of time the corresponding camera remains operatively connected to the monitor and by successively triggering successive switching modules so that a system may be assembled with any desired number of cameras and switching modules. A bistable regenerative circuit is employed in the control module as a clock. Loss of synchronization between the cameras by the monitor is avoided by switching at electronic speeds.

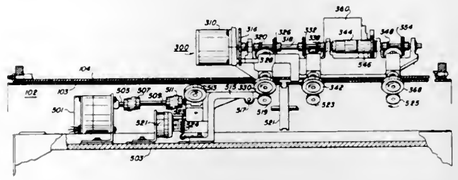
3,580,999
REDUNDANCY REDUCTION DATA COMPRESSOR WITH LUMINANCE WEIGHTING
Frank W. Mounts, Colts Neck, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Dec. 23, 1968, Ser. No. 786,243
Int. Cl. H04n *7/12*
U.S. Cl. 178—7.1 **5 Claims**



A redundancy reduction data compressor is described for processing a video signal having time subintervals called frames, the amplitude level of which signal is an indication of the luminance level in a scene being viewed. An entire frame of samples from the signal is stored in a frame memory. Each new sample from the signal is compared with its corresponding stored sample having the same time position within the frame. If the new sample is found to differ from the stored sample by more than a threshold level, the new sample is stored in a buffer memory to await transmission over a transmission channel. The threshold level is a function of the luminance level of the new sample and number of samples stored in the buffer memory, such that a sample from the high brightness region of the picture and/or a larger number of samples in the buffer memory result in a larger threshold level.

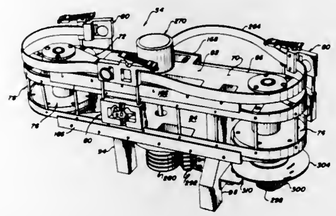
3,581,000
INCREMENTAL STEPPING PAPER DRIVE
Richard C. Hansen, Penfield; Charles J. Mahler, Fairport; Nicholas M. Soures, Webster, and Thomas L. Stickney, Rochester, all of, N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Filed Oct. 7, 1968, Ser. No. 765,538
Int. Cl. H04n *1/22;* **B65h** *5/06*
U.S. Cl. 178—7.6 **11 Claims**

An incremental stepping paper drive assembly for advancing a document or the like past a scanning station in a facsimile communication system. In combination with a binary digit encoder and buffer storage unit, the incremental



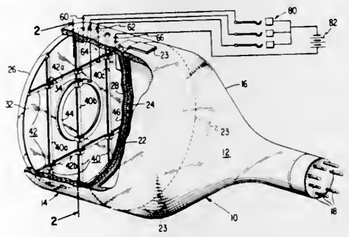
stepping paper drive assembly is activated and interrupted in accordance with the amount of information detected, encoded and stored in order to maintain maximum information transmission over a limited bandwidth transmission medium.

3,581,001
FACSIMILE SCANNER ASSEMBLY
Frans Brouwer, Glencoe, and Frank L. Sobchak, Chicago, Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.
Division of Ser. No. 613,545, Feb. 2, 1967. Filed Dec. 1, 1969, Ser. No. 881,056
Int. Cl. H04n *1/24*
U.S. Cl. 178—7.6 **15 Claims**



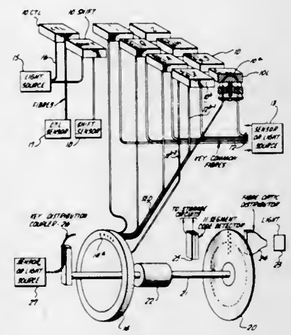
A scanner assembly for a facsimile transceiver in which three combination optical scanner and printer contact units are mounted on a specially designed timing belt trained about driven and idler pulleys. The belt comprises two narrow steel strips joined together by pin members which register with recesses in the pulleys. Each of the assemblies is detachable from the timing belt and includes means for separately adjusting the operating positions of the optical scanner and the printer contact with respect to the total assembly.

3,581,002
DISPLAY DEVICE FOR PROVIDING GRATICULES OF VARIOUS CONFIGURATIONS
Wellesley Jamison Dodds, Mt. Lakes, N.J., assignor to RCA Corporation
Filed Apr. 1, 1969, Ser. No. 811,861
Int. Cl. H04n *5/72*
U.S. Cl. 178—7.84 **10 Claims**



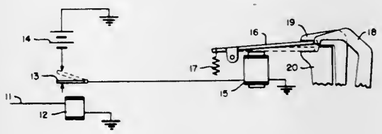
A novel display device including a means for displaying a visual image to the view of an observer and a means for providing a changeable graticule in front of the visual image in the view of the observer. The means for providing a changeable graticule includes a plurality of transparent electrode pairs with a liquid crystal material contained therebetween for displaying the graticule. Connection means for electrically energizing selected ones of the electrode pairs are provided.

3,581,003
KEYBOARD
William C. Leone, Palos Verdes Estates, and Robert Lee Malone, Palos Verdes Peninsula, Calif., assignors to Ex Cell-O Corporation, Detroit, Mich.
Filed Mar. 15, 1968, Ser. No. 713,343
Int. Cl. H04l *15/16;, 17/02;* **B41j** *5/08*
U.S. Cl. 178—17 **8 Claims**



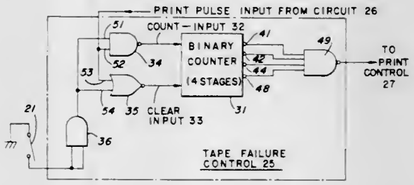
A keyboard for providing electrical output indications encoded in a preselected code in response to the operation of a key. Each key of the keyboard providing a light signal-transmitting path for transmitting light rays from a light source to an optical encoding element for transmission to a photoelectric means to provide the electrical output indications in accordance with a preselected code representative of an operated key. The keyboard includes gating circuit means for controlling the correct pattern of electrical output indications to be produced from the encoding element.

3,581,004
INVERTED SELECTOR MECHANISM
Arthur A. Hagstrom, Hoffman Estates, Ill., assignor to Teletype Corporation, Skokie, Ill.
Filed Oct. 24, 1968, Ser. No. 770,159
Int. Cl. H04l *17/16*
U.S. Cl. 178—33 **2 Claims**



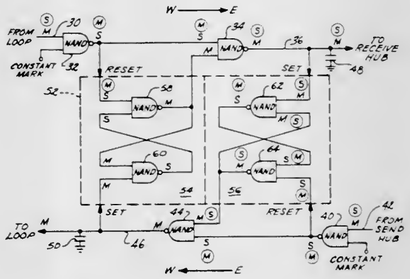
A selector mechanism including a line relay, a selector magnet, circuitry controlled by the line relay for energizing the selector magnet whenever the line relay is deenergized and vice versa, and means controlled by the selector magnet for producing a marking output whenever the selector magnet is deenergized and for producing a spacing output whenever the selector magnet is energized.

3,581,005
DELAYED ACTION TAPE FAILURE CONTROL FOR HIGH-SPEED TAPE PRINTER
John Fulton, Brookfield, Ill., assignor to Extel Corporation, Chicago, Ill.
Filed June 9, 1969, Ser. No. 831,516
Int. Cl. H04l *13/06*
U.S. Cl. 178—42 **4 Claims**



A delayed action tape failure control for a high-speed tape printer, tape punch, or like machine actuated by recurring pulse signals, comprising a NAND gate and a NOR gate connected to the count and reset inputs, respectively, of a binary counter; the print pulse signals are applied to one input of each gate and a tape presence detector switch, located ahead of the print or punch mechanism, is connected to the other input of each gate. As long as tape is present, the counter is maintained in cleared condition and machine operation continues; when tape is absent, the counter counts print pulses and machine operation is interrupted when a given count is reached.

3,581,006
DUPLEX CONTROL CIRCUIT
Jacob L. Wallace, Jr., Springfield, Va., assignor to The Susquehanna Corporation, Fairfax County, Va.
Filed Mar. 22, 1968, Ser. No. 715,402
Int. Cl. H04l *5/14*
U.S. Cl. 178—58 **7 Claims**

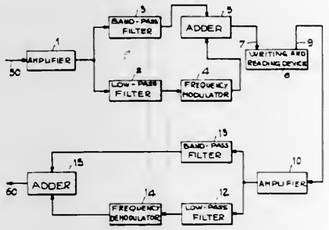


An example of the duplex control circuit is a circuit formed of two logic flip-flops connected between two channels of a half-duplex telegraph circuit. This duplex control circuit functions to prevent reflections or feedback of the transmissions into the inactive channel. Each channel is controlled by one of the flip-flops whereby the flip-flop controlling the inactive channel is set and locks this channel to a marking condition whenever a spacing signal is processed by the active channel and does not become reset until this spacing signal terminates at the input to the inactive channel.

3,581,007
MAGNETIC RECORDING AND REPRODUCING APPARATUS FOR COLOR TELEVISION SIGNALS USING A FREQUENCY MODULATED SUBCARRIER FOR THE TRANSMISSION OF THE COLOR INFORMATION

Pierre Cassagne, Asnieres, France, assignor to Compagnie Francaise De Television

Continuation of application Ser. No. 582,013, Sept. 26, 1966, now abandoned. This application Dec. 10, 1969, Ser. No. 880,484
Int. Cl. H04n *9/36*
U.S. Cl. 178—5.4 **1 Claim**

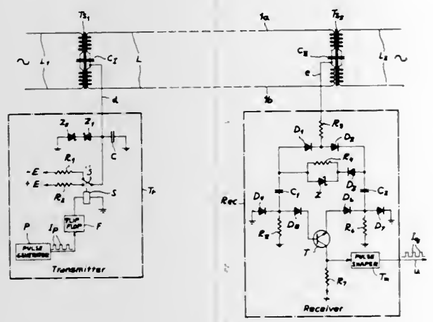


Magnetic recording and reproducing apparatus for a SECAM-type color television signal comprising a frequency modulated color subcarrier, wherein the color subcarrier is separated, brought to a constant amplitude and recorded together with either an auxiliary carrier frequency modulated by the lower frequency luminance components, or with the attenuated lower frequency luminance components themselves.

3,581,008
PULSE-TRANSMISSION SYSTEM

Giorgio Dal Monte, Milan, and Nicola Pitidis, Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.a., Milan, Italy

Filed Sept. 26, 1968, Ser. No. 762,752
Claims priority, application Italy, Sept. 27, 1967, 20935-A/67
Int. Cl. H04l *25/02*
U.S. Cl. 178—63 **10 Claims**

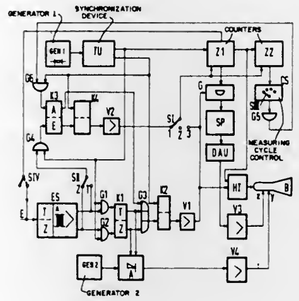


Telecommunication system in which counting pulses or other short input signals are transmitted over a line by respective reversals of polarity which, at the receiving end, are detected and translated into a train of output pulses at a cadence corresponding to that of the train of input pulses giving rise to the polarity reversals.

3,581,009
DISTORTION MEASUREMENT CIRCUIT

Erwin Schenk, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed Sept. 22, 1967, Ser. No. 669,743
Claims priority, application Germany, Sept. 23, 1966, S106,065
Int. Cl. H04i *1/00*
U.S. Cl. 178—69 **5 Claims**

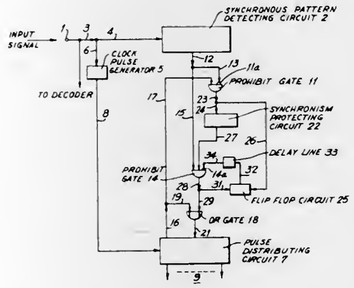


A time distortion measurement circuit for use in conjunction with telegraphy apparatus wherein deviations from the theoretical time duration of steps corresponding to high speed telegraphic information transmission may be displayed on an oscilloscope. The distortion time, if any, of each telegraph information step is determined and stored so that a corresponding distortion indicating signal may be applied to the oscilloscope for a time interval equal to the time duration of the succeeding telegraph step. Thereby a distortion indicating signal of sufficient time duration to effect visual display of step time distortion is applied to the oscilloscope. Counting devices are employed that are responsive to a transition between successive steps and, more particularly, to a change in polarity of the applied telegraph signal, to produce control signals corresponding to their count that are stored and applied to the oscilloscope until the succeeding transition occurs. An indication of the actual time duration of the steps, and consequently of the percentage error between the actual time duration and the theoretical fixed time duration of the steps, is thereby obtained.

3,581,010
FRAME SYNCHRONIZATION SYSTEM FOR SYNCHRONIZING THE FRAME OF A DIGITAL SIGNAL TRANSMISSION

Toshio Kobayashi, Yokohama-shi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 14, 1967, Ser. No. 682,807
Claims priority, application Japan, Nov. 18, 1966, 41-76012
Int. Cl. H04l *7/08*
U.S. Cl. 178—69.5 **6 Claims**

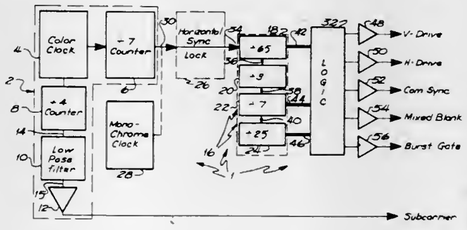


A digital signal pulse train is supplied to a detector which detects the synchronous pattern of the pulse train. A pulse distributor distributes the digital signal pulse train under the control of the detected synchronous pattern by forcibly resetting the frame of the distributed digital signal pulses when the frame of the digital signal pulse train is nonsynchronous and providing a reset pulse for resetting itself independently of the forcible resetting at least once per frame of the digital signal pulse train. A gate circuit connected between the detector and the pulse distributor prohibits further forcible resetting of the pulse distributor until the next succeeding frame of the digital signal pulse train.

3,581,011
TELEVISION BROADCAST SYNCHRONIZING APPARATUS AND METHOD

Ronald C. Ward, Salt Lake City, and David T. Allen, Provo, Utah, assignors to Telemation, Inc., Salt Lake City, Utah

Continuation of application Ser. No. 677,286, Oct. 23, 1967, now abandoned. This application July 28, 1969, Ser. No. 848,142
Int. Cl. H04n *5/04*
U.S. Cl. 178—69.5TV **25 Claims**

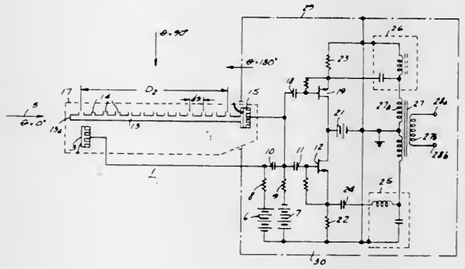


A high-quality television synchronizing system, including method and apparatus, which uses a high clock or oscillator frequency and causes, solely through division of frequency, each leading and trailing edge of all sync. generator output pulses to be accurately clock-derived. In this way, inter alia, very meaningful improvements in black and white, and color time base stability, including far better color subcarrier phase stability, are attained and need for time adjustment capability is removed. Superior sync. lock characteristics are also provided.

3,581,012
UNIDIRECTIONAL MICROPHONE

Kanesuke Kishi; Noboru Tsuchiya, Kanagawa-ken, and Kazuo Shimura, Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 3, 1968, Ser. No. 742,378
Claims priority, application Japan, July 13, 1967, 42/45210
Int. Cl. H04r *1/20*
U.S. Cl. 179—1 **6 Claims**

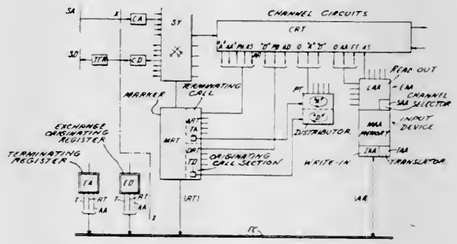


A unidirectional microphone in which a second order gradient microphone and a wave-type microphone are combined so as to obtain an improved directional microphone with the low frequency components obtained from the second order gradient microphone and the medium and higher frequency components being obtained from the wave-type microphone so as to obtain a composite output signal which has a uniform and narrow directive pattern and a smooth frequency response characteristic over a wide frequency range.

3,581,013
MOBILE RADIOTELEPHONE COMMUNICATION SYSTEM

Jean Jacques Muller, Garches, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 19, 1968, Ser. No. 785,105
Claims priority, application France, Dec. 21, 1967, 133,321
Int. Cl. H04g *7/04*
U.S. Cl. 179—41 **10 Claims**

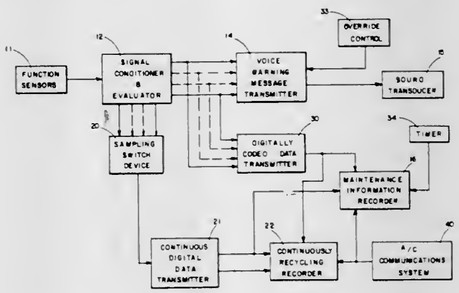


A mobile telephone system is provided with radio telephone and paging equipment which is serviced over a group of channels allotted to a fixed radio telephone station. The latter provides automatic communication between the customers of a public telephone ground network and mobile sets. A free channel is marked by a tone, to be taken in a telephone call. Paging call numbers directed to paging mobile sets are transmitted from the station if the required channel is free. If the channel is not free, these paging calls alternate with the radiotelephone communications. In order to more effectively use the equipment, the called paging numbers are stored and then transmitted in limited trains of numbers.

3,581,014
INTEGRATED SYSTEM FOR REPORTING AIRCRAFT DATA

Alvin R. Vogel, Los Angeles; Douglas A. Moore, Rolling Hills; Martin P. Folan, Long Beach, and John R. Buck, Gardena, Calif., assignors to Northrop Corporation, Beverly Hills, Calif.

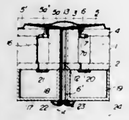
Continuation-in-part of application Ser. No. 656,425, July 27, 1967, now abandoned. This application Feb. 9, 1970, Ser. No. 9,644
Int. Cl. G08b *3/10;* **G08g** *5/00*
U.S. Cl. 179—100.1 **6 Claims**



Various aircraft parameters are sensed by function sensors, the outputs of these sensors being fed to a signal conditioner and evaluator where the signals are processed and the mag-

nitudes of these various parameters evaluated. When the magnitude of any of these parameters is above or below certain predetermined limits, an output signal is fed to a transmitter which transmits a voice message indicating the out-of-limits condition. The occurrence of out-of-limit conditions for any of these parameters is also digitally encoded and recorded for future reference. Certain outputs of the signal evaluator and conditioner indicative of selected aircraft flight and operating conditions are continually fed to a digital data encoder where they are placed in suitable condition for recording in digital form and from where they are fed to a continually recycling recorder for recordation.

3,581,015
DYNAMIC MICROPHONE
Takeo Masuda, Tokyo, Japan, assignor to Aiwa Co., Ltd., Tokyo, Japan
Filed Dec. 26, 1967, Ser. No. 693,436
Claims priority, application Japan, Aug. 31, 1967, Aug. 31, 1967, Sept. 6, 1967, Dec. 28, 1966, Dec. 28, 1966, 42/74645; 42/74646; 42/76302; 42/531; 42/532
Int. Cl. H04r *1/34*
U.S. Cl. 179—121 **9 Claims**

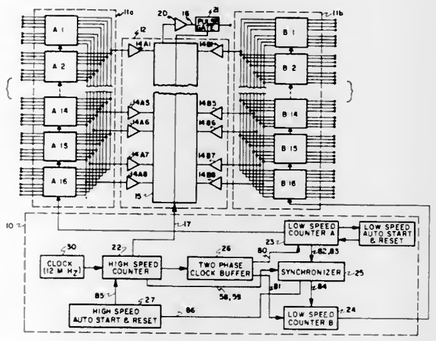


This specification discloses a novel dynamic microphone using a flat annular magnet formed of an anisotropic barium ferrite as a permanent magnet to establish a magnetic circuit. The present microphone is extremely flat and of an excellent tone quality, and it can be manufactured at low cost. Various modifications to the microphone of this type become easily possible, and therefore a variety of examples with unidirectional characteristics or other characteristics are disclosed in this specification.

3,581,016
TIME-SHARING TELECOMMUNICATION SYSTEM
Saverio Martinelli, and Giorgio De Varda, both of Milan, Italy, assignors to Societa Italiana Telecommunicazioni Siemens S.p.A., Milan, Italy
Filed Feb. 26, 1969, Ser. No. 802,486
Claims priority, application Italy, Feb. 26, 1968, 13197-A/68
Int. Cl. H04j *3/00*
U.S. Cl. 179—15AT **11 Claims**

A telephone exchange serving subscriber and trunk lines on a time-sharing basis has three circulating memories operating in synchronism, the operating cycle of each memory representing a frame of 100 phases or time slots serving for the registration of the number of a calling party in a phase of the first memory (100), the number of a called party in a corresponding phase of the second memory (200) and information on the progress of a call between the two parties in the same phase of the third memory (300). The second time slot (phase Φ_2) of the second memory (200) is utilized as a binary counter successively registering, during consecutive frames, the addresses or call numbers of all lines served by the exchange. Each address thus inscribed is entered, one frame later, in a buffer register (800) for the duration of the following frame; concurrently, the line switches of the station identified by that address are briefly closed to sample the line voltage for the presence or absence of loop current. Special provisions are made for the calling of an outgoing trunk identified by a first digit "O" in its three-digit address. Other phases (Φ_1, Φ_3, Φ_4) at the beginning of each frame are utilized for the automatic checking of the equipment, with instant substitution of a standby memory (500) for the monitoring memory (300) or for any one of the three digital sections of either address memory (100, 200), designed as identical modules, if such module is found to be defective.

3,581,017
ELECTRONIC MULTIPLEXER
Roger L. Stevens, Sierra Madre; Peter A. Putnam, Montebello, and Martin Sicona, San Jose, Calif., assignors to Aerojet-General Corporation, ElMonte, Calif.
Filed June 13, 1968, Ser. No. 736,835
Int. Cl. H04j *3/04*
U.S. Cl. 179—15A **7 Claims**

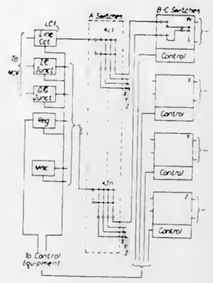


This disclosure involves an all electronic time division multiplexer system designed to sample a large number of millivolt level signal sources at a megacycle sampling rate. [It also includes blanking circuitry which eliminates unwanted transients.] The system comprises three subsystems, a counter and two multiplexer gate subsystem, the first subsystem operating at the basic sampling rate and the second synchronized by the counter at the higher rate. The disclosure illustrates synchronization, blanking and gating circuitry to accomplish the necessary functions. Timing diagrams illustrate the switching sequences to provide accurate multiplexing without loss of data or introduction of unwanted switching transients into the multiplexed signal.

3,581,018
MULTISTAGE TELEPHONE SWITCHING NETWORK
Geoffrey Harland, London, and John P. Ronayne, Edgware, England, assignors to International Standard Electric Corporation, New York, N.Y.
Filed June 12, 1969, Ser. No. 832,678
Claims priority, application England, June 28, 1968, 30935/68
Int. Cl. H04q *3/00*
U.S. Cl. 179—22 **10 Claims**

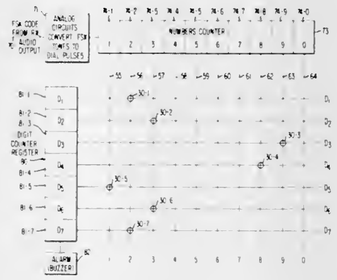
A telecommunications exchange in which connections are set up through cascaded stages (designated A, B, C & D) of coordinate switching matrices. Certain of the stages are paired in two-stage networks, and a number of these networks (four are disclosed) are used. The intermediate stages (B and C) of a four stage exchange are paired, and certain of the B stage switches handle only calls to and from lines, and

others handle only calls to and from junctions. The third or C stage mixes calls involved in traffic of either type. The



switches of the final or D stage are used only between one side of the links and the switches of the C stage.

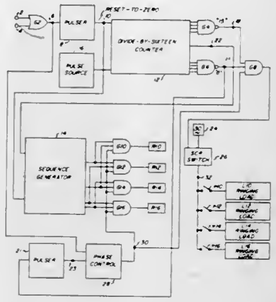
3,581,019
CARD CONTROL OF RADIO TELEPHONE
Donald P. Ryan, Bloomfield, N.J., assignor to Cessna Aircraft Company, Wichita, Kans.
Filed July 30, 1968, Ser. No. 748,813
Int. Cl. H04g *7/04*
U.S. Cl. 179—41 **3 Claims**



Card control of radiotelephone facility. A matrix circuit receives a card, which is apertured, punched or embossed in accordance with the number which the radiotelephone equipment is to respond, the channels in which it is to be operative, to complete transmitter and receiver circuits therefor, and disable channels not used and otherwise control use of the facility by authorized persons. Other features of the invention are disclosed in the specification and drawings.

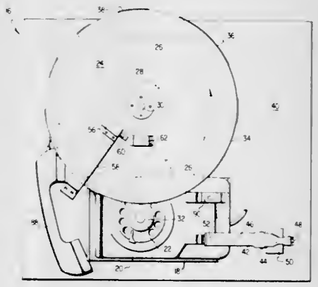
3,581,020
RINGING TONE DISTRIBUTION CIRCUITS
Morris Ribner, and Alfred M. Hestad, Chicago, Ill., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Aug. 22, 1969, Ser. No. 852,172
Int. Cl. H04m *1/26*
U.S. Cl. 179—84R **7 Claims**

A logic system is provided for supplying ringing tone in successive bursts of one-second duration to each of four bays. The system provides the tone in a repetitive cycle so that the load of only one bay is placed on the source at one time. The system provides a period between each one-second



burst to enable relay contacts to be opened and closed in the absence of ringing tone.

3,581,021
CONDITION RESPONSIVE AUTOMATIC DIALING APPARATUS
Carl S. Pettit, Box 164, Sweethome, Ark.
Filed June 3, 1968, Ser. No. 734,130
Int. Cl. H04m *1/44*
U.S. Cl. 179—90 **1 Claim**

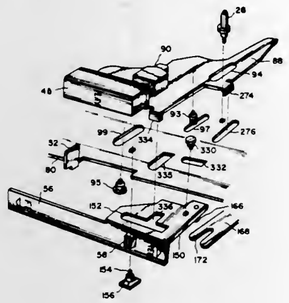


The disclosure relates to an automatic telephone dialing system wherein a driven rotary input member is rotated about a fixed axis adjacent the dial of a conventional telephone to, sequentially, rotate the dial in a clockwise direction and release the same for return to its initial rest position to dial a preselected multiple digit number. The rotation and release of the dial is effected by providing a plurality of spaced driven engaging elements positioned about the periphery of the input member which are rotated, seriatim, into and out of drive engaging relationship with a drive engaging element mounted on the dial. The number, length and spacing of the spaced drive engaging elements correspond to a preselected multiple digit telephone number.

3,581,022
MINIATURE TAPE RECORDER
Sadao Shigetomi, Sagamihara City, and Shoichi Saito, Tokyo, Japan, assignors to Olympus Optical Company Limited, Tokyo, Japan
Filed Nov. 12, 1968, Ser. No. 774,653
Claims priority, application Japan, June 29, 1968, 43/54791; 43/54792; 43/54793; 43/54794
Int. Cl. G11b *15/02, 23/02*
U.S. Cl. 179—100.2Z **6 Claims**

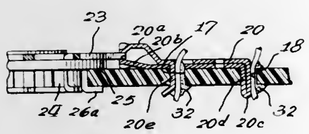
A miniature tape recorder having a flat elongated casing capable of being held in one hand of a user. A cassette mounting means is located on the front side of the casing

along a longitudinal edge thereof. An operating means, including a record pushbutton, a record-reproduction pushbutton, a stop pushbutton, and a slidable tape speed control button, is mounted on the opposite longitudinal edge of the casing. A cassette knockout button is located on the back side



of the casing in the proximity of the cassette mounting means, while a volume rotary knob, for actuating a volume control means, is located on the same side edge as the cassette mounting means with spacing from the knockout button.

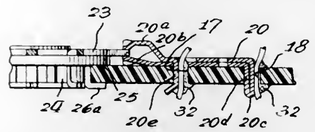
3,581,023
WAFER ROTARY SWITCH WITH STATOR PRINTED CIRCUIT CONTACT STRUCTURE AND ROTOR
Walter Meyer, McHenry, Ill., assignor to Oak Electro/Netics Corp.
Division of Ser. No. 798,923, Feb. 13, 1969. Filed Dec. 1, 1969, Ser. No. 881,201
Int. Cl. H01h *19/58*
U.S. Cl. 200—11 **1 Claim**



A printed circuit rotary switch with stator clips soldered thereon and having wiping surfaces spaced from the surface of the switch section. The rotor blade is mounted on a flanged body, in alignment with the wiper contacts and has legs extending through the rotor opening securing the rotor to the stator. The stator has spiral inductors for a tuner printed on one surface, with the beginning terminal of one inductor radially aligned with the ending terminal of the next and joined by a stator contact.

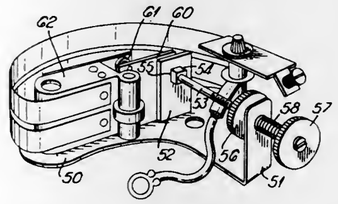
3,581,024
WAFER DISC ROTARY SWITCH WITH STATOR PRINTED CIRCUIT CONTACT STRUCTURE AND ROTOR
Walter Meyer, McHenry, Ill., assignor to Oak Electro/Netics Corp.
Filed Dec. 1, 1969, Ser. No. 881,202
Int. Cl. H01h *19/58*
U.S. Cl. 200—11 **7 Claims**

A printed circuit rotary switch with stator clips soldered thereon and having wiping surfaces spaced from the surface of the switch section. The rotor blade is mounted on a flanged body, in alignment with the wiper contacts and has legs extending through the rotor opening securing the rotor to the stator. The stator has spiral inductors for a tuner printed on one surface, with the beginning terminal of one in-



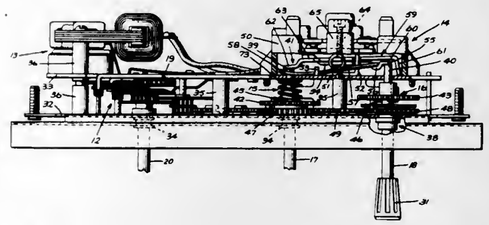
ductor radially aligned with the ending terminal of the next and joined by a stator contact.

3,581,025
ELECTRICAL CONTACT BREAKER MECHANISMS WITH IMPROVED CONTACT GAP ADJUSTMENT MEANS
Roland J. Yeo, 40 Broadlands Road, Avondale, Salisbury, and Jean E. Colley, 18, Coghlan Road, Greendale, Salisbury, Rhodesia
Filed Jan. 2, 1969, Ser. No. 788,564
Claims priority, application Rhodesia, Jan. 15, 1968, 408/67
Int. Cl. H01h *19/00, 19/62, 1/50*
U.S. Cl. 200—19 **2 Claims**



A contact breaker assembly for use with a distributor of a spark ignited internal combustion engine including a first electrical contact point associated with a cam follower and adapted for reciprocatory movement in consonance with the cam follower. A second electrical contact point associated with a bearer member and with hand-operable adjustment means adapted to open or close the gap between the first and second contact points. The hand-operable adjustment means comprises a knurled wheel associated with resiliently biased restraining means and with a screw threaded rod adapted to progress the second electrical contact point towards or away from the first electrical contact point.

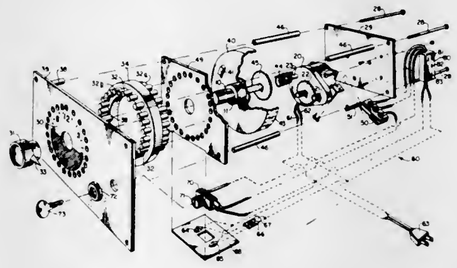
3,581,026
TIMER WITH VISUAL INDICATOR FOR PERIOD OF OPERATION
Gerhard K. Losert, Louisville, Ky., assignor to General Electric Company
Filed Nov. 12, 1968, Ser. No. 774,718
Int. Cl. H01h *7/08, 43/10*
U.S. Cl. 200—38R **10 Claims**



A timer includes a switch and a manually adjustable shaft longitudinally movable between a set and an unset position.

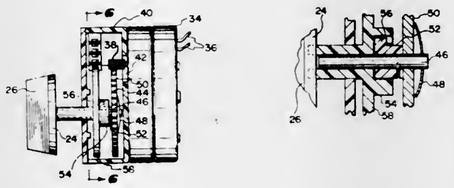
There is a motor-driven gear for releasing the shaft from its set position to provide time-controlled actuation of the switch. A first visual indicator is movable with the gear to show the proper termination time for a desired period of switch actuation. The shaft is movable relative to the gear when the shaft is in its set position to determine the period of switch actuation. A second visual indicator is movable with the shaft. The first and second visual indicators together show when the desired period of switch actuation has been set.

3,581,027
PUSH BUTTON TIME CYCLE CONTROLLER
Herbert F. Lindsay, 12047 Chester Drive, Baton Rouge, La.
Filed Jan. 6, 1969, Ser. No. 789,288
Int. Cl. H01h *43/00*
U.S. Cl. 200—38 **10 Claims**



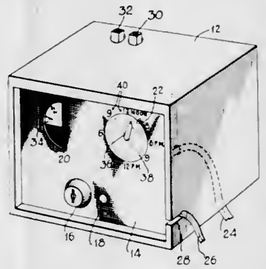
A pushbutton time cycle controller by virtue of which operations can be programmed, conducted, or carried out according to definitely timed sequences usually arranged over a 12-hour or 24-hour period. The controller comprises the combination of a dial face pushbutton assembly, the pushbuttons of which are arranged in patterns or orbitals for preselected setting in desired timed sequence, for activation of an electrical circuit by physical coaction between the pushbuttons and a displaceable synchronously rotating cam-disc or cam-disc assembly, which is brought into contact with a pressure responsive electrical switch in response to pushbutton settings. The pressure responsive electrical switch performs a preselected operation by energizing an external electrical circuit, or circuits.

3,581,028
LIQUIDIZER TIMER JOGGER WITH IMPROVED DRIVE MEANS INCLUDING LOST MOTION CONNECTION
Bruno M. Valbona, Avon, Conn., assignor to Dynamics Corporation of America, New York, N.Y.
Filed Nov. 20, 1969, Ser. No. 878,432
Int. Cl. H01h *7/08, 43/10*
U.S. Cl. 200—38 **15 Claims**



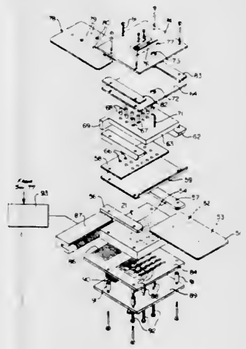
An electrically powered liquidizer controlled by a timer-jogger switch means actuated by a lost motion between a manual control and a driven slip clutch member when the control is turned in one direction to energize the liquidizer and a timer drive member without relative lost motion, and turned in the opposite direction with lost motion to manually energize the liquidizer continuously or intermittently for a period of time which, at will, can be a long or momentary period of time. The control is resiliently held in OFF position against inadvertent movement.

3,581,029
TV ON TIME CONTROL
Douglas G. Noiles, 114 Elm Place, New Canaan, Conn.
Filed Sept. 10, 1968, Ser. No. 758,820
Int. Cl. H01h *7/08*
U.S. Cl. 200—38 **21 Claims**



A control comprising a securable case having an internal outlet into which a TV set may be plugged with the TV set plug secured within the case. ON and OFF pushbuttons are provided. When the ON button is depressed, the TV set may be operated for up to a predetermined total time. During this time, an accumulator wheel driven by a timing motor through a clutch rotates up to a predetermined angular position. When this position is attained, the internal outlet of the device is disconnected from the power line. When the OFF button is depressed, the outlet is not supplied with power and the accumulator wheel is not driven by the timing motor. Each 24 hours a reset wheel upon attaining a predetermined angular position causes the accumulator wheel to be reset to its initial position.

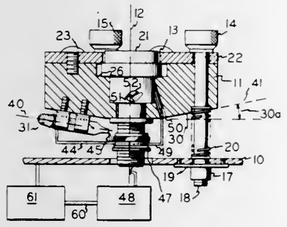
3,581,030
MAGNET ACTUATED MECHANISM FOR USE WITH CARD HAVING MAGNETIC AREAS
Bruce S. Sedley, Glendale, Calif., assignor to H. O. Bohme, Inc., Westbury, N.Y.
Filed Jan. 2, 1969, Ser. No. 788,372
Int. Cl. H01h *43/08*
U.S. Cl. 200—46 **41 Claims**



A magnetic actuated switch for use with a data card having a number of magnetic areas arranged in characteristic pattern. The switch includes a slot into which the card can be in-

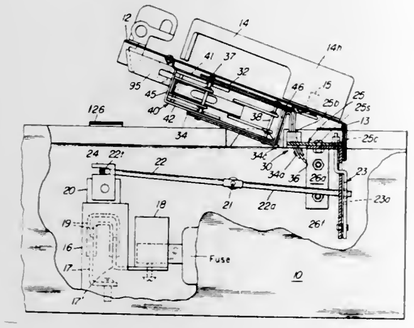
serted so that its magnetic elements are in juxtaposition with vertically oriented reed switches which are also arranged in the same characteristic pattern as its elements. One contact of the reed switch is magnetized in accordance with the polarity of the data card's magnetic areas and the other contact is magnetized in accordance with the polarity of a fixed magnetic biasing means included in the switch. The reed switch is closed if the two appropriate polarities are opposite each other. The switches can be connected in any suitable matrix pattern such as for binary coded decimal readout for reading data on the card or for the operation of a device such as a relay or door lock. Alternatively a dual coded card may be used where one code is read by a matrix of switches and the other code performs an unlocking function by means of an associated magnetically operated mechanism.

3,581,031
AN IMPROVED TILT SWITCH
Michael Brian, Birmingham, Mich., assignor to the United States of America as represented by the Secretary of the Navy
Filed Feb. 2, 1970, Ser. No. 7,496
Int. Cl. H01h *35/02*
U.S. Cl. 200—61.47 **6 Claims**



An improved tilt switch having a plurality of mercury switches disposed about a housing and mounted at an angle with respect to the level or horizontal, and having a resilient adjusting means for coupling the housing to a member whose tilt is to be measured.

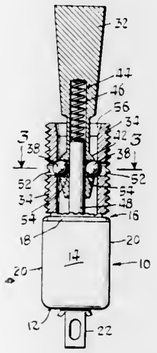
3,581,032
ENCLOSED SWITCH WITH COVER-CARRIED OPERATOR AND INTERLOCK MECHANISM
Paul M. Christensen, West Orange, N.J., assignor to Arrow-Hart, Inc., Hartford, Conn.
Filed Aug. 11, 1969, Ser. No. 848,948
Int. Cl. H01h *9/20*
U.S. Cl. 200—50 **27 Claims**



An enclosed switch, of the type wherein the switch-operating handle is mounted on a hinged cover of a box, has snap action actuating mechanism and interlocking mechanism which are also mounted on the cover, the snap action mechanism being operably connected with the switch-operating mechanism at all times so that the contacts can be disengaged while the cover is open and the cover can be closed while the contacts are either engaged or disengaged; but, the switch contacts can not be moved into engagement while the cover is open without disabling the interlock.

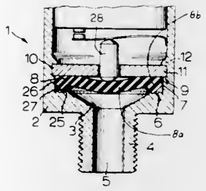
A turnable handle operates snap action means having an actuated element operating transversely of the enclosure to actuate the operating mechanism and switch contacts which move in different planes at right angles thereto in the enclosure.

3,581,033
TOGGLE SWITCH
Frank J. Plumb, Prospect, Conn., assignor to J-B-T Instruments, Inc., New Haven, Conn.
Filed May 19, 1969, Ser. No. 825,809
Int. Cl. H01h *13/28*
U.S. Cl. 200—67 **9 Claims**



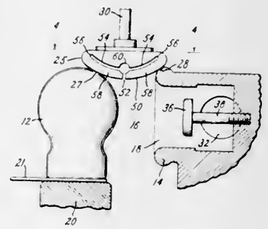
A toggle switch which has an operating lever extending through and pivoted in a threaded mounting barrel. In a longitudinal bore of the lever there is a compression spring and a plunger the latter being acted on by the spring and engaging a movable switch contact. The pivotal mounting of the lever comprises two ball bearings disposed at opposite sides of the lever and carried respectively in pairs of registered sockets and the lever and barrel, said sockets being external to the longitudinal bore of the lever whereby space is readily available in the bore for the plunger and spring.

3,581,034
FLUID-PRESSURE-ACTUATED SWITCH
Karl Schupp, Pforzheim, and Hans Weismann, Stuttgart-Feuerbach, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed Mar. 7, 1969, Ser. No. 805,333
Claims priority, application Germany, June 12, 1968, P 17 65 576.4
Int. Cl. H01h *35/40*
U.S. Cl. 200—83 **11 Claims**



A fluid-pressure-activated switch has a housing provided with an internal annular recess for the marginal portion of an elastomeric diaphragm whose central portion bulges into the pressure chamber of the housing. The pressure chamber is located opposite a second chamber which receives one or more contacts. The diameter of the annular recess is equal to or smaller than the diameter of the diaphragm and the axial length of the recess is slightly smaller than or at most substantially equal to the thickness of the marginal portion of the diaphragm. The marginal portion includes an axially extending annular bead whose thickness is included in the thickness of the marginal portion and which has a lower resistance to deformation than the material of the remainder of the diaphragm so as to be moved in spite of unevenness on an associated sideface into tight sealing engagement with that face bounding one axial end of the recess when pressure is introduced into the pressure chamber, causing the central portion of the diaphragm to flatten out and to effect radial expansion of the diaphragm which, being resisted by contact of the diaphragm edge with the bottom wall of the contact of the diaphragm edge with the bottom wall of the recess, results in yielding of the material of the margin of the diaphragm in axial direction and thereby in an increase in the thickness of the margin.

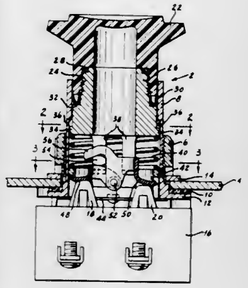
3,581,035
GAS-BLAST CIRCUIT INTERRUPTER WITH MAGNETIC MEANS FOR ACCELERATING MERGER OF SERIES-RELATED ARCS
William H. Rathbun, Pittsfield, Mass., assignor to General Electric Company
Filed Apr. 30, 1969, Ser. No. 820,461
Int. Cl. H01h *33/70*
U.S. Cl. 200—148 **2 Claims**



Discloses a gas-blast circuit breaker comprising two spaced-apart stationary contacts and a movable bridging contact extending therebetween. The bridging contact has an arc-running surface facing the space between the stationary contacts and a centrally located gap that divides the arc-running surface into two spaced-apart sections. Two slots in the bridging contact extend in opposite directions from the gap generally parallel to and behind the arc-running surface. This configuration of the bridging contact is such that the current paths through the two arcs formed upon contact separation are of such configuration that magnetic forces are developed for driving the arcs together and accelerating their merger into a single arc.

3,581,036
PUSH-PULL ELECTRIC SWITCH OPERATOR
William G. Dennison, Milwaukee, Wis., assignor to Cutter-Hammer, Inc., Milwaukee, Wis.
Filed Oct. 13, 1969, Ser. No. 865,726
Int. Cl. H01h *3/12*
U.S. Cl. 200—172 **6 Claims**

A single return spring biases a switch operator against movement to either operating position by being compressed against either an internal shoulder formed in the operator housing or against the inner edge of an inserted ring. A pair of projections on the movable operator nest between a pair of switch actuating levers to bear directly downward upon one lever in the push direction and to rock the other lever downward in the pull direction. The levers are designed with a two-to-one mechanical advantage to reduce the stroke length of the operator.



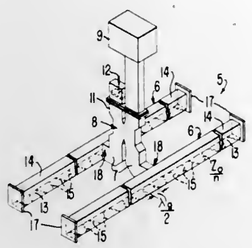
3,581,037
EXTENSION DEVICE FOR TOGGLE SWITCHES
Richard A. Schiffelbein, 226 Freeman, Topeka, Kans.
Filed Oct. 15, 1969, Ser. No. 866,602
Int. Cl. H01h *3/04*
U.S. Cl. 200—172A **1 Claim**

An extension device for connection to a pivotal toggle of a wall located toggle switch to facilitate operation of the switch by a small child or another who is unable to reach to the toggle of the switch.

3,581,038
MICROWAVE APPLICATOR EMPLOYING A BROADSIDE RADIATOR IN A CONDUCTIVE ENCLOSURE
Norman H. Williams, San Francisco, Calif., assignor to Varian Associates, Palo Alto, Calif.
Filed May 2, 1969, Ser. No. 821,176
Int. Cl. H05b *9/06, 5/00*
U.S. Cl. 212—10.55 **8 Claims**

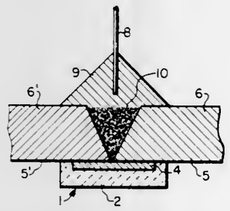
A microwave applicator for treating material with microwave energy is disclosed. The applicator includes a relatively large conductive enclosure containing a large

broadside microwave radiating antenna disposed for directing the radiated microwave energy onto the load of lossy



material for treating same. The applicator is particularly useful for treating relatively large amounts of lossy material.

3,581,039
METHOD OF ONE-SIDE ARC WELDING AND BACKING MATERIAL THEREFOR
Fumiaki Kanzaki; Yoshio Kozakura; Kozo Akahide, Chiba-shi, and Tamotu Suzuki, Shimizu-shi, Japan, assignors to Kawasaki Steel Corporation, Kobe-shi, Japan and Nippon Kokan Kabushikikaisha, Tokyo, Japan
Filed Oct. 16, 1968, Ser. No. 767,962
Claims priority, application Japan, Oct. 16, 1967, Dec. 13, 1967, 42/66,420;42/79,480
Int. Cl. B23k *9/18*
U.S. Cl. 219—73 **17 Claims**



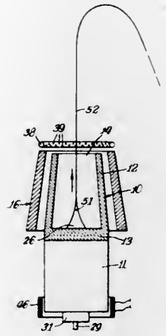
A method for welding steel plates and the like from one side, and a backing material therefor are provided which yields welds of exceptional quality, uniformity, and control. The weld backing material comprises a rigid channeled portion, containing an elastic mineral fiber composite in the channel, where the depth of the channel and the thickness of the fiber composite are determined by the following formula:

$$D=\frac{\rho c \text{ min.}}{\rho i}(d+m)$$

where D is the thickness of the composite, d is the depth of the channel, ρ c min. is the minimum compressed volumetric specific gravity of the composite, ρ i is the initial volumetric specific gravity of the composite, and m is the maximum misalignment of the plates to be welded. Welding is accomplished by compressing the backing material along the back of the joint to be welded and welding from the opposed side.

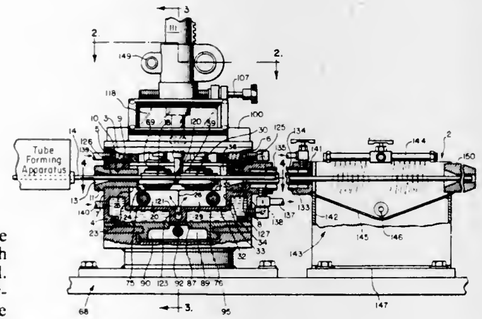
3,581,040
FORMING OF THIN METAL FILAMENTS
James W. Halley, Chesterton, Ind., assignor to Inland Steel Company, Chicago, Ill.
Filed June 11, 1969, Ser. No. 832,201
Int. Cl. H05b *5/00*
U.S. Cl. 219—7.5 **12 Claims**

This disclosure deals with an apparatus and process for forming thin metal filaments from liquid metal. An electrically conductive metal is placed in a crucible having an opening therein, the metal either having been previously heated to a liquid state or being so heated while in the crucible. A coil is positioned adjacent the metal and a current pulse is passed through the coil. The current flow generates an intense mag-



netic field which compresses or squeezes the metal, causing the metal to be forced out of the magnetic field through the opening in the crucible in the form of an elongated filament.

3,581,041
WELD BOX FOR TUBE FORMING MILL
Glenn F. Balfanz, Jr., 3912 Hampton Ave., Western Springs, Ill.
Filed Mar. 28, 1969, Ser. No. 811,496
Int. Cl. B23k *9/02*
U.S. Cl. 219—60 **10 Claims**

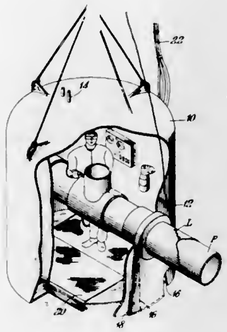


A weld box having laterally spaced walls with inlet and outlet ports through which a tube to be welded passes, preweld and postweld rollers mounted in the box and adjustable with respect to the welding rod to hold the tube accurately aligned with the rod and prevent the tube from twisting, the rollers rotatable on bearings which are isolated electrically from the rollers to prevent their destruction, the box provided with an inert gas diffuser which is located beneath the weld area and the inlet and outlet having gas outlets to protect the tube from atmospheric contaminants upon entering and exiting the weld box. The box has a tube cooling chamber and a spray trough to cool the tube when it exits the weld box.

3,581,042
UNDERWATER WELDING METHOD
Frank J. Pilia, Short Hills, N.J., assignor to Ocean Systems Incorporated, Reston, Va.
Continuation-in-part of application Ser. No. 664,784, Aug. 31, 1967. This application June 19, 1969, Ser. No. 839,778
Int. Cl. B23k *9/16*
U.S. Cl. 219—61 **5 Claims**

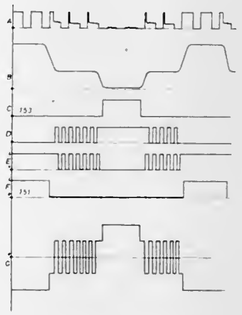
The invention provides a method of welding heavy metal sections located deep under water without having to raise the

sections to the surface. The method consists of lowering a chamber having an open bottom until it encloses the area to be worked upon. Preferably a pressurized gas is introduced into the chamber as it is being lowered in order to prevent the water from rising beyond a certain level which is maintained in a dry condition. After the chamber is set in place, a



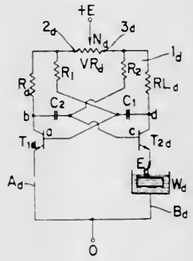
pressurized gas is introduced to displace the remaining water in the chamber. Thereafter the chamber atmosphere is preferably maintained in a substantially inert condition and the weld made with a nonconsumable electrode-inert gas-welding apparatus operating with a 1/64- to ¼-inch arc length at 85 to 250 amps and at a voltage sufficient to maintain a stable arc.

3,581,043
APPARATUS FOR THE CONTROL AND REGULATION OF THE WORK GAP OF AN ELECTROEROSION MACHINE
Werner Ullmann; Costantino Tadini, and Ehsan Salim, Locarno, Switzerland, assignors to A. G. fur Industrielle Elektronik AGIE, Locarno, Switzerland
Filed July 9, 1968, Ser. No. 743,362
Claims priority, application Switzerland, July 11, 1967, 9820/67
Int. Cl. B23p *1/14*
U.S. Cl. 219—69 **10 Claims**



A circuit arrangement for the control and regulation of the width of a work gap of an electroerosion machine is disclosed. An electrical signal, the magnitude of which is indicative of the condition of the work gap, is fed to the input of a circuit arrangement which comprises a plurality of parallel switching stages, each responsive to different magnitudes of the electrical signal, the outputs of the circuit arrangement being at least partially coupled with a feed device for the work gap. A particular level of an electrical signal derived from the conditions of the work gap is associated with each of the switching stages. Hence, one switching stage responds to noload operation, in other words high voltage at the work gap, another stage to approximate short circuit conditions at the work gap, in other words, very low voltage at the work gap, and a further switching stage responds to normal operating conditions at the work gap.

3,581,044
CONTINUOUSLY VARIABLE POWER SUPPLY FOR ELECTRIC DISCHARGE MACHINES CAPABLE OF MAINTAINING A CONSTANT RATIO BETWEEN AMPLITUDE AND DURATION OF DISCHARGE CURRENT
Daisaku Watari, and Tosio Morita, Kasuya-gun, Japan, assignors to Seibu Denki Kogyo Kabushiki Kaisha, Kasuya-gun, Japan
Filed Oct. 22, 1968, Ser. No. 769,545
Claims priority, application Japan, Nov. 2, 1967, 42/92847
Int. Cl. B23p *1/08*
U.S. Cl. 219—69 **9 Claims**

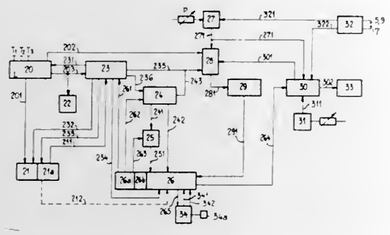


Power supply means for applying continuously variable power across the spark electrode-to-workpiece circuit of an electric discharge machine. The spark electrode is connected in one branch of a multivibrator circuit, and control means are provided for continuously varying the amplitude of the current flowing through said branch while maintaining constant the ratio of the amplitude of this current flow to the duration of said flow. The control means comprises a variable resistor the ends of which are connected across the corresponding ends of the two branch circuits of the multivibrator circuit with the sliding piece connected to one terminal of the voltage source.

3,581,045
DIGITALLY CONTROLLED ELECTROEROSION MACHINE
Rudolf Panschow; Herbert Russbuelt, Hannover; Volker Suhr, Garbsen, Germany, and Werner Ullmann, Locarno, assignors to A G fur Industrielle Elektronik AGIE, Locarno, Switzerland
Filed Nov. 7, 1968, Ser. No. 774,080
Claims priority, application Switzerland, Nov. 14, 1967, 15863/67
Int. Cl. B23p *1/12*
U.S. Cl. 219—69 **12 Claims**

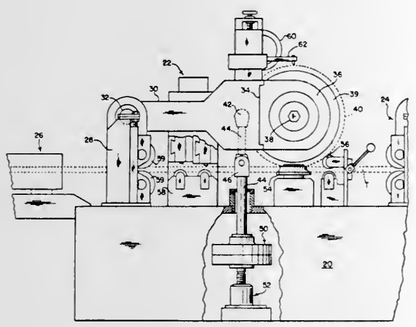
A program-controlled electroerosion machine is described having a novel numerical control arrangement incorporating a computer interconnected with novel supporting and controlling apparatus. The subject inventive control arrangement operates so as to detect from an information-recording medium a desired travel path of relative movement between the electrode and workpiece and, from such detected information, digital pulses are produced and applied to incremental

drive means such as stepping motors to effect the relative movement. The subject invention incorporates the provision of a reverse storage means incorporated to receive the digital drive pulses and store the same in a sequential manner. In the event of a short circuit or other disturbance at the work gap,



the novel reverse storage means causes relative movement to be effected in a reverse fashion to retrace the desired path of movement until the disturbance is eliminated. Subsequent thereto, normal forward operation of the control apparatus proceeds.

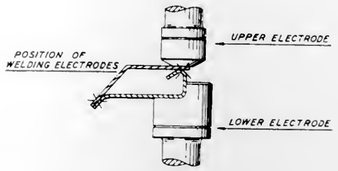
3,581,046
PRESSURE CONTROL FOR TUBE MILL
Charles E. Letsche, 505 Garwood, Prospect Heights, Ill.
Filed Oct. 28, 1968, Ser. No. 808,711
Int. Cl. B23k *11/06, 31/06*
U.S. Cl. 219—82 **6 Claims**



An improved tube mill generally employed in the production of steel tubing by the continuous electric resistance welding of an axially extending seam cleft in a cylindrical tube length formed from a continuous length of metal strips, and directly responsive fluid pressure means to maintain a constant pressure relationship between the welding element and the support means for said tubes to produce uniform welds in said tubing.

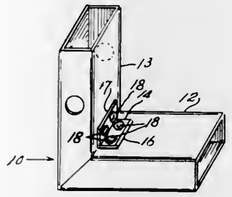
3,581,047
SPOT WELDING PROCESS
James W. Mitchell, Jr., Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed May 14, 1969, Ser. No. 824,635
Int. Cl. B23k *11/30*
U.S. Cl. 219—91 **2 Claims**

A process for the production of a hollow, stiff, noncircular fabricated steel structural member in which the assembly is accomplished by spot welding. The critical spot weld in this assembly is accomplished by causing the welding current to flow along a sheet metal member then through the sheet metal member and supporting the sheet metal member along



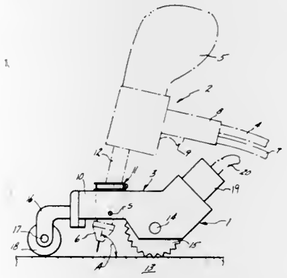
which the current flows against columnar collapse by contact with a complementary surface of a welding electrode.

3,581,048
WELDED MEMBER
Stephen V. Leonardo, 1128 Blanchard St., Downers Grove, Ill.
Filed Aug. 8, 1969, Ser. No. 848,584
Int. Cl. B23k *11/14*
U.S. Cl. 219—93 **1 Claim**



My metal crotch weldment is L-shaped and bent to form substantially horizontal and vertical portions, each with nibs adapted to be spot welded to the substantially horizontal and vertical portions of a bent metal tubing. When my L-shaped crotch weldment is positioned with the nibs against the substantially horizontal and vertical portions of a bent tubing and an active electric spot welder is applied to said weldment, the heat therefrom to the nibs causes the nibs to flow into fusion with said portions for retaining the portions of the tubing in fixed spaced position.

3,581,049
SEMIAUTOMATIC WELD APPARATUS WITH MEANS FOR CHANGING ELECTRODE ANGULAR DISPOSITION
Lou C. Creith, Allentown, Pa., assignor to Olin Corporation
Filed Nov. 12, 1969, Ser. No. 875,991
Int. Cl. B23k *9/12*
U.S. Cl. 219—125 **12 Claims**



A device for varying the angle of inclination between a welding torch and a workpiece. The device is employed in a semiautomatic welding apparatus which includes means for guiding a welding torch along a weld seam at a predetermined rate. The device comprises two cylinders each having

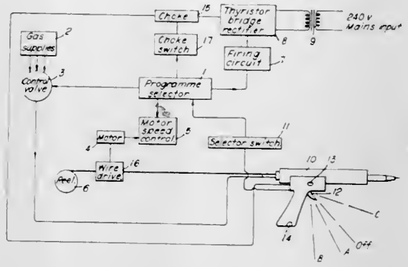
a hole bored through it end to end, with the longitudinal axis of the bore canted with respect to the longitudinal axis of the cylinder. One cylinder fits within the bore of the other and the welding torch is placed in the bore of the inner cylinder. The angle at which the welding torch is inclined to the workpiece can be varied by rotating the cylinders with respect to each other and with respect to the welding torch barrel. After obtaining a desired angle of inclination, both the cylinders and the torch barrel are locked in place.

3,581,050
ELECTRIC ARC-WELDING SYSTEMS
Kenneth William Brown, and Nigel C. Balchin, both of Cambridge, England, assignors to National Research Development Corporation, London, England
Filed July 29, 1968, Ser. No. 748,536
Claims priority, application Great Britain, Aug. 1, 1967, 35204/67
Int. Cl. B23k *9/00*
U.S. Cl. 219—130 **9 Claims**

Different preselected combinations of the values of welding parameters in a consumable electrode arc-welding process are obtained when a selector switch is moved through its different positions. The switch is inserted into the hub of the reel of electrode wire which is to be fed to the welding torch. The reels are coded so that the switch is moved to a position which will select a combination of values appropriate for the wire carried by that reel.

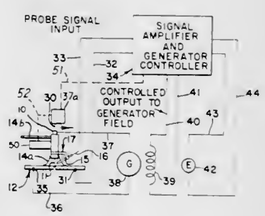
3,581,051
WELDING APPARATUS
Kenneth William Brown, Cambridge, England, assignor to National Research Development Corporation, London, England
Filed July 29, 1968, Ser. No. 748,387
Claims priority, application Great Britain, Aug. 1, 1967, Feb. 29, 1968, Mar. 8, 1968, 35,247/67; 9,906/68; 11,429/68
Int. Cl. B23k *9/10*
U.S. Cl. 219—131 **10 Claims**

In a consumable electrode arc welding process different combinations of the various parameters (open circuit arc voltage, wire feed speed, series inductance, shielding gas) are stored on a plug board by interconnecting each input bus with preselected output buses. The input buses are connected through a selector switch to a voltage source. As the selector switch is moved through its different positions a voltage is applied to the different input buses in turn. The output buses



are connected to relays which control the selection of the different parameters.

3,581,052
SHIELDED ARC WELDING CONTROL SYSTEM
Rex W. Milton, Houston, Tex., assignor to Bauer & Associates, Inc.
Continuation-in-part of application Ser. No. 813,436, Apr. 4, 1969, now abandoned. This application June 18, 1969, Ser. No. 834,291
Int. Cl. B23k *9/10*
U.S. Cl. 219—131 **10 Claims**

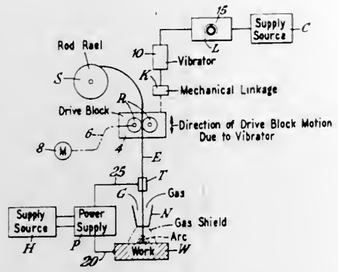


A feedback control system responsive to the ion density in the arc envelope of a welding electrode. The sensing end of a potential gradient probe is positioned in the arc envelope, and a signal is developed in the probe that is proportional to the position of the arc with respect to the workpiece. The induced signal is transmitted to a signal amplifier which responds to signal deviations from a reference signal position of the probe. The output signal from the amplifier controls the degree of field excitation applied to an electrical-welding generator field winding from an exciting source. The amplifier output signal may also be used to control the rate of welding electrode feed as well as the rate of welding head travel. The variable output voltage of the welding generator is connected between the welding electrode and the workpiece to directly control the position of the arc. In this way the output voltage of the welding generator is responsive to the potential gradient of the arc and correctly positions the arc for depositing weld metal on the workpiece.

3,581,053
SYNCHRO-ARC METAL TRANSFER
August F. Manz, Union, N.J., assignor to Union Carbide Corporation
Filed Dec. 5, 1967, Ser. No. 688,157
Int. Cl. B23k *9/00*
U.S. Cl. 219—137 **7 Claims**

Electric arc working apparatus and process for controllably transferring metal from a consumable electrode to a workpiece by applying recurrent power pulses to said elec-

trode while oscillating said electrode at a multiple frequency relative to the power pulse recurrence frequency, and selec-

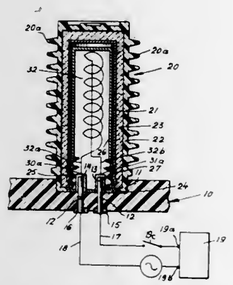


tively displacing the phase between said power pulses and said electrode oscillations.

3,581,054
WELDING ELECTRODE
Jarl Allan Bjorkroth, Avesta, Sweden, assignor to Avesta Jernverks Aktiebolag, Avesta, Sweden
Filed Sept. 24, 1969, Ser. No. 860,846
Claims priority, application Sweden, July 27, 1965, 9876/65
Int. Cl. B23k *35/22*
U.S. Cl. 219—146 **7 Claims**

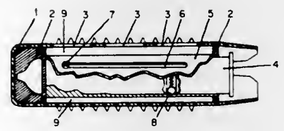
A coated electrode for electric arc welding having a core comprising 0.01—0.05 percent carbon, 0.1—0.9 percent silicon, 0.2—2.5 percent manganese, 14.5—18.0 percent chromium, 3.5—6.0 percent nickel, 0.1—2.2 percent molybdenum, 0.02—0.12 percent nitrogen and the remainder iron. The proportion of the constituents are adjusted so that the chromium equivalent (e.g. percent chromium + percent silicon + percent molybdenum) plus the nickel equivalent (e.g. percent nickel + [0.5 × percent manganese] + [30 × (percent carbon + percent nitrigen)]) is between 24.5 and 27, and 1.4 times the chromium equivalent minus the nickel equivalent is between 16 and 19.3. The welding electrode yields a weld metal having a microstructure consisting of ferrite, martensite, and austenite.

3,581,055
CURLING BOBBIN AND HEATER
Tomio Makino, Tokyo, Japan, assignor to Nichiel Denki Sangyo K.K.
Filed June 3, 1968, Ser. No. 734,095
Int. Cl. A45d *4/12, 2/36;* **H05b** *1/00*
U.S. Cl. 219—222 **8 Claims**



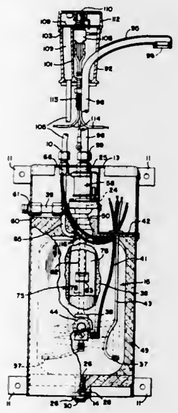
A curling bobbin and heater assembly includes a bobbin having an outer cylinder with a plurality of radial projections for twining hair, an intermediate cylinder formed of heat storing material, such as paraffin or polycarbonate, and an inner cylinder formed of a material of high thermal conductivity. The inner and outer cylinders are attached by means of an inwardly directed flanged portion on the outer cylinder. The inner cylinder closely fits around and receives a cylindrical electric-heating element is detachable from a base member which includes terminal pins which are received in corresponding sockets on the heating element. The heating element is detachably secured to the inner shell of the bobbin so that, is desired, the heating element and bobbin can be removed from the base member as a unit.

3,581,056
HAIR CURLER HAVING A HIGH HEAT STORAGE CORE TELESCOPICALLY MOUNTED THEREIN
Richard Djenner, Holte, Denmark, assignor to Olaf Bendik Elmer, Copenhagen, Denmark
Filed Apr. 17, 1969, Ser. No. 817,006
Claims priority, application Denmark, Apr. 19, 1968, 1740/68
Int. Cl. A45d *2/24*
U.S. Cl. 219—222 **4 Claims**



Hair curler including a cylindrical wall made of plastic material and a guide tube provided with stop means adjacent each end thereof and mounted within such cylindrical wall so as to form an air space between the cylindrical wall and the guide tube. A central core having substantially the same length as the curler itself and made of a material having a large specific heat is adapted for axial displacement within the guide tube between a first position in which it is completely inserted into the curler and a second position in which one end of the core is projecting from the curler. The core has means cooperating with the above end stops for stopping the core at the above mentioned first and second positions. Pressure means are associated with the core and the guide tube for providing sufficient friction against displacement of the core with respect to the tube.

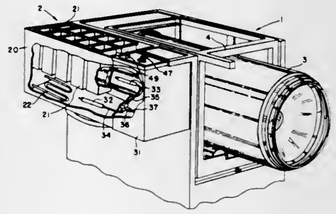
3,581,057
HOT WATER HEATER
Theodore F. Meyers, Medina, Ohio, assignor to The Hobart Manufacturing Company, Troy, Ohio
Filed Oct. 8, 1969, Ser. No. 864,766
Int. Cl. H05b *1/00*
U.S. Cl. 219—312 **17 Claims**



Air is introduced and retained within a nonpressurized hot water heater tank when water is supplied to the tank and is slowly exhausted after the water supply is shut off to provide space within the tank for expansion of the water when

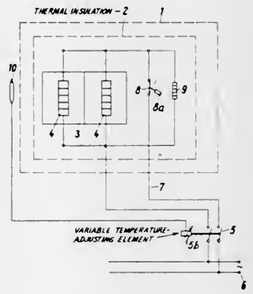
heated. In the embodiment shown, air is aspirated into the water supply and is accumulated within an inverted cup located within the tank. When the water supply stops, air escapes from the cup thereby providing a space within the tank into which the water can expand.

3,581,058
APPARATUS FOR PROCESSING PHOTOGRAPHIC MATERIALS
Paul Romano, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Jan. 18, 1968, Ser. No. 698,832
Int. Cl. F24h *1/00*
U.S. Cl. 219—330 **6 Claims**



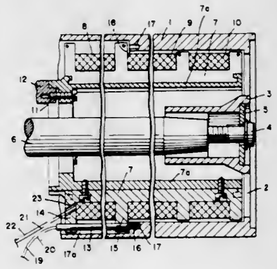
An apparatus for processing photographic liquid including a processing drum which utilizes and discharges successively received unit charges of photographic processing liquid, a container for storing a unit charge of the liquid to be received by the drum, a heating element for heating the container and a fluid pressure temperature sensor in thermal communication with the heating element and the drum for regulating the temperature of the liquid in the container in inverse proportion to the ambient temperature surrounding the drum.

3,581,059
APPARATUS FOR HEATING A STORAGE CORE OF A HEAT STORING FURNACE
Richard Breltmeyer, Winnenden, and Karl Amann, Schmiden, Germany, assignors to Bauknechte GEA Electrotechnische Fabriken Gesellschaft mit beschrankter Haftung, Stuttgart, Germany
Filed Sept. 15, 1966, Ser. No. 579,541
Claims priority, application Germany, Sept. 17, 1965, B83772
Int. Cl. F25h *7/00;* **H05b** *1/02*
U.S. Cl. 219—378 **4 Claims**



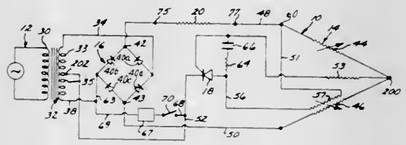
A heat storage furnace is provided with a storage core enclosed in a thermally insulated housing. Electric heating elements are provided for heating the core. A main thermal switch responsive to temperatures exteriorly of the housing deenergizes the core heating elements when a predetermined maximum temperature is exceeded. An additional thermally responsive switch is connected in series with the main thermal switch and is arranged to respond to the temperature in the immediate vicinity of an auxiliary heating element connected so as to be energized through the additional thermal switch. The auxiliary heating element is positioned in the housing and is thermally remote from the main thermal switch. The additional thermal switch cyclically opens and closes the circuit to the core heating elements during the charging period before the temperature at the exterior of the housing exceeds the predetermined maximum and the main thermal switch deenergizes the heating elements to terminate the charging period.

3,581,060
TEMPERATURE CONTROL DEVICE IN A HEATED GALETTE
Karl Bauer, and Herbert Turk, Remscheid-Lennep, Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany
Filed July 12, 1968, Ser. No. 744,550
Claims priority, application Germany, July 14, 1967, Aug. 14, 1967, B93489;B72212
Int. Cl. H05b *1/02*
U.S. Cl. 219—469 **8 Claims**



A rotatable galette for transporting threads, filaments, tapes and the like capable of being controllably heated, preferably by an internally and concentrically mounted stationary induction coil, in which the roller jacket of the galette is an outer cylindrical wall having on its inner surface a radially outwardly recessed portion adapted to receive the terminal heat-sensitive end of an elongated temperature measuring feeler gauge.

3,581,061
TEMPERATURE CONTROL SYSTEM PROVIDING FULL-WAVE CONDUCTION INTO TEMPERATURE CHANGE APPARATUS
William W. Chambers, Anaheim, Calif., assignor to Robertshaw Controls Company, Richmond, Va.
Filed Sept. 5, 1968, Ser. No. 757,695
Int. Cl. H05b *1/02*
U.S. Cl. 219—499 **7 Claims**

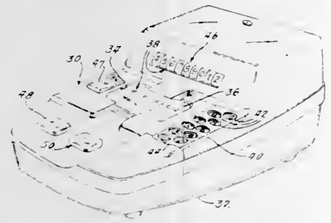


A temperature control system for connection in series with an alternating current source and an environmental change apparatus, the system including a temperature-sensitive bridge circuit which becomes unbalanced in response to environmental temperature change, the unbalance triggering a controlled rectifier which applies power from the source to the environmental change apparatus, a full-wave bridge rectifier of the system applying positive anode voltage to the controlled rectifier during both negative and positive polarity half-cycles of the source voltage.

3,581,062
ELECTRONIC THERMOSTAT
Keith Aston, England, assignor to The Pavelle Corporation, New York, N.Y.
Filed Feb. 18, 1969, Ser. No. 815,511
Claims priority, application Great Britain, Feb. 19, 1968, 8014/68
Int. Cl. H05b *1/02*
U.S. Cl. 219—501 **3 Claims**

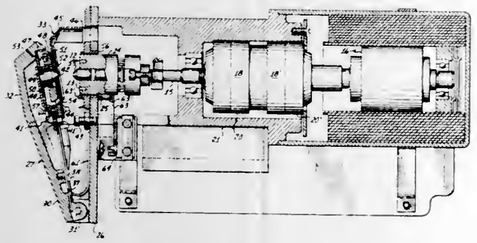
A compact, unitary electronic thermostat is formed by encapsulating a temperature sensing element and a solid-state control circuit in a potting compound having good heat transfer characteristics. The unitary thermostat, which includes a solid-state electronic switch having conductive and nonconductive states which are varied in response to the output from the temperature sensing element to control a load power supply may be completely or partially immersed in a fluid environment.

3,581,063
VERIFICATION MEANS FOR CHARACTER GROUPS
Joseph L. Levasseur, St. Louis, Mo., assignor to Simcom Corporation, High Ridge, Mo.
Filed Dec. 30, 1968, Ser. No. 787,648
Int. Cl. G06k *7/00*
U.S. Cl. 235—61.7B **31 Claims**



Means for verifying that a character group such as a character group that represents an account number such as might be used on a credit card or like device is or is not known to be objectionable for some reason, including means for comparing a particular character group with a plurality of other similar type character groups and indicating the results of the comparison. The invention also includes novel means for storing and moving character groups and other means for reading and/or sensing the stored character groups during movements thereof.

3,581,064
RECORD SCANNER WITH LOADING AND INDEXING MEANS
Ansell W. Palmer, Hampton, N.H., assignor to Honeywell Information Systems Inc.
Filed Apr. 30, 1969, Ser. No. 820,539
Int. Cl. G06k *7/015;* **G11b** *5/82, 25/04*
U.S. Cl. 235—61.11D **10 Claims**

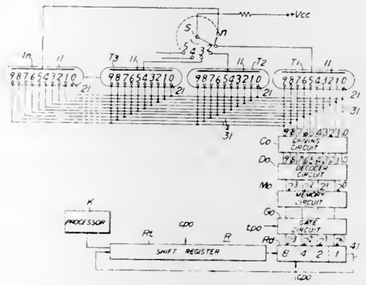


A record scanner is loaded by an operator placing a record on a locating pin while in an open position. Upon closing, the record is transferred to a probe which indexes the record for circular scanning by a rotary transducer.

ERRATUM

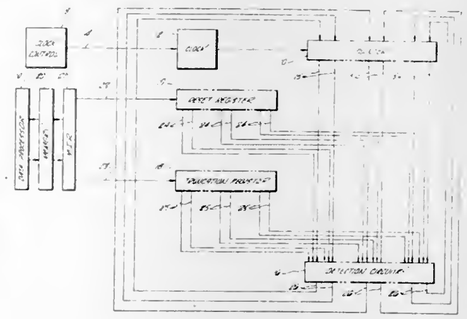
For Class 235—92 see:
Patent No. 3,580,496

3,581,065
ELECTRONIC DISPLAY SYSTEM
Yoshikazu Hatsukano, and Kosei Nomiya, both of Kodaira-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Nov. 22, 1967, Ser. No. 685,047
Claims priority, application Japan, Dec. 2, 1966, 41/78,684
Int. Cl. H03k *21/22*
U.S. Cl. 235—92 **14 Claims**



This specification discloses an electronic display system for an information processing apparatus adapted for visual display of information through the use of indicator tubes. In the present system, a shift register and change over switch means for periodically and sequentially distributing the operating potential to the anode of each indicator tube are provided for the purpose of simultaneously and effectively operating the plurality of indicator tubes by means of a single common control device comprising a single driving circuit, decoder circuit and gate circuit connected with the indicator tubes. Thus, an information signal is periodically and sequentially read out by means of the gate circuit, whereby the control device is operated, and the changeover switch means is operated in synchronism with said information signal to cause the indicator tubes to be periodically glow-discharged.

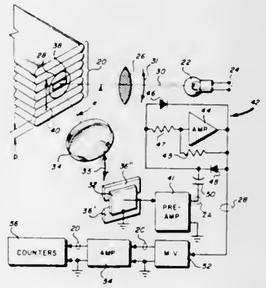
3,581,066
PROGRAMMABLE COUNTING CIRCUIT
Douglas R. Maure, San Marino, Calif., and Mei Goon Wong, Los Angeles, both of, Calif., assignors to Lear Siegler, Inc., Santa Monica, Calif.
Filed Mar. 6, 1968, Ser. No. 711,066
Int. Cl. H03k *21/32*
U.S. Cl. 235—92 **18 Claims**



A programmable counting circuit in which the cycling of a multistage counter is controlled by reset information and

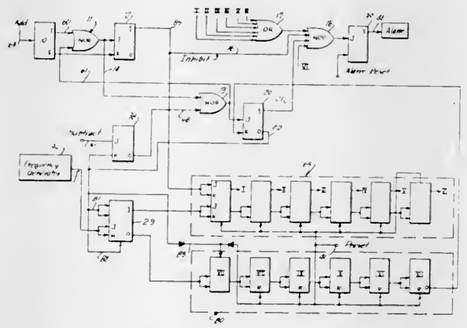
truncation information stored in no more than two registers. A detection circuit generates a "forward carry" signal when the contents of the counter match the contents of a reset register and generates a "reverse carry" signal when the forward carry signal appears in a stage for which a bit is presented in a truncation register. The detection circuit utilizes the "reverse carry" signal to generate reset signals for the counter stage associated with the bit and all prior stages. The detection circuit utilizes subsequent bits in the truncation register to effect the resetting of subsequent groups of stages of the counter whenever the contents of these groups match the corresponding contents of the reset counter. In another embodiment, decoding circuitry utilizes an additional information bit in the reset register to present truncation information sufficient for a single truncation in the absence of a truncation register.

3,581,067
PITCH MATCHING DETECTING AND COUNTING SYSTEM
Samuel P. Willits, and William L. Mohan, both of Barrington, Ill., assignors to Spartanics Limited, Palatine, Ill.
Filed Dec. 2, 1968, Ser. No. 780,367
Int. Cl. G06m *9/00*
U.S. Cl. 235—92V **23 Claims**



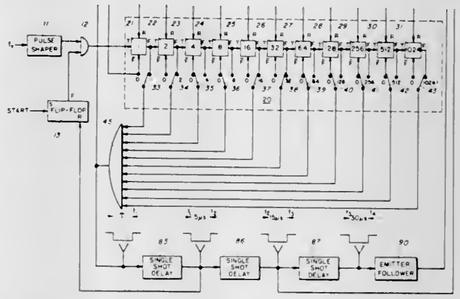
An apparatus for counting stacked sheetlike materials having no sheet separation requirements. The active area of the sensor array is matched to the width of a sheet of the stack and the sensor array caused to traverse the stack, the complex signal output of the sensor array being stripped of the unwanted components in a high gain, diode clamped capacitive input operational amplifier whose square wave output is processed and counted in conventional counting circuits.

3,581,068
COUNTER CONTROLLED DIGITAL LIMIT DETECTOR
Robert D. Wyatt, Costa Mesa, Calif., assignor to the United States of America
Filed Jan. 7, 1969, Ser. No. 791,536
Int. Cl. G06m *3/14, 3/02*
U.S. Cl. 235—92 **6 Claims**



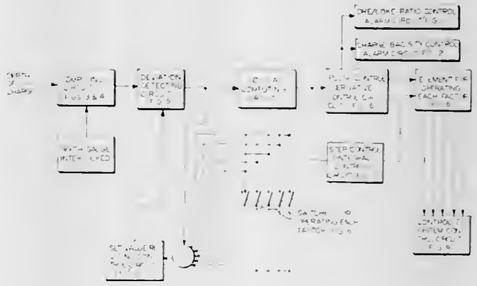
A main counter of "*n*" stages counts in an additive direction and an auxiliary counter of "*n*" stages counts in an additive direction to gate 2^n-1 pulses into the main counter to effect a subtraction in a digital limit detector system. Alarm generating circuitry is activated when the count in the main counter reaches a preset number representing a limit in a monitored device.

3,581,069
FREQUENCY TO BINARY CONVERTER
Arthur M. Pederson, Mercer Island, Wash.
Filed Nov. 14, 1967, Ser. No. 682,841
Assignor to the United States of America as represented by Secretary of the Navy
Int. Cl. H03k *23/00*
U.S. Cl. 235—92 **7 Claims**



A sound velocity frequency signal to binary signal conversion and storage system. A high frequency crystal controlled oscillator and counter are controlled by a velocimeter counter to supply a binary number to binary storage flip-flops in accordance with the pulse frequency rate input to the velocimeter counter. The number stored is inversely proportional to the average sound velocity for the period of measurement.

3,581,070
APPARATUS FOR OPERATING A SHAFT FURNACE BY DETECTING THE FALLING SPEED OF THE CHARGE
Keiji Tsujihata; Masatoshi Shimada; Hiromi Asai; Yasuhiro Sawada, and Zensaku Ayuha, all of, Japan, assignors to Nippon Steel Corporation
Continuation of application Ser. No. 348,631, Mar. 2, 1964, now abandoned. This application Nov. 1, 1968, Ser. No. 774,581
Int. Cl. G06f *15/46*
U.S. Cl. 235—151.1 **2 Claims**



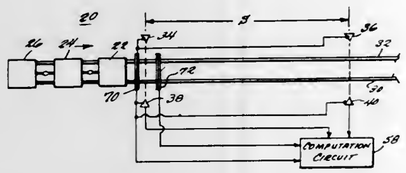
This invention relates to a method and apparatus for always maintaining optimum operating conditions of a blast furnace by measuring the sinking speed of the charge and detecting deviations thereof from a predetermined sinking speed obtained statistically, superposing signals of logical operation obtained by the analysis of various factors representing operating conditions of the furnace on the signal representing the said deviation, and subjecting the blast con-

ditions such as temperature and humidity of blast, amount of fuel and amount of blast to a pulse control and or stepped control according to the result of the superposition.

3,581,071
TRAIN LENGTH MEASURING DEVICE

Lawrence A. Payseure, Baltimore, Md., assignor to The Chesapeake and Ohio Railway Company, Cleveland, Ohio and The Baltimore and Ohio Railroad Company, Baltimore, Md.

Filed Apr. 10, 1969, Ser. No. 815,075
Int. Cl. G01b *7/04*
U.S. Cl. 235—151.32 **14 Claims**

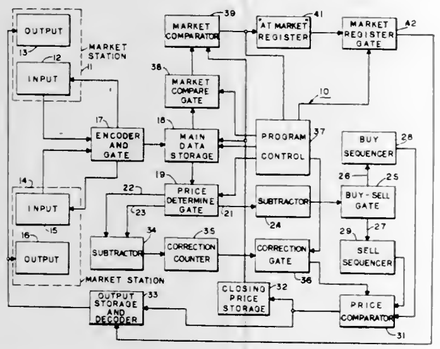


An apparatus and method for measuring the overall length of a series of connected and moving articles each of which may be of indeterminate length. The example to be described comprises interconnected railroad cars forming a train. The total length of the train is determined by employing two separated photocells and two light sources, each source normally shining on a respective photocell, so that each car of the moving train sequentially breaks the lightbeams to the photocells causing the photocells to produce electrical outputs. Since the distance between the two photocells is known and the time which each car takes to travel from one to the other is easily determined from the occurrences of output signals from the photocells, the distance from the beginning of one car to the beginning of the next is computed, the computations being accumulated to indicate the total train length.

3,581,072
AUCTION MARKET COMPUTATION SYSTEM

Frederick Nymeyer, 366 E. 166th St., Holland, Ill.

Continuation-in-part of application Ser. No. 317,026, Oct. 17, 1963, now abandoned. This application Mar. 28, 1968, Ser. No. 723,644
Int. Cl. G06f *7/38*
U.S. Cl. 235—152 **23 Claims**

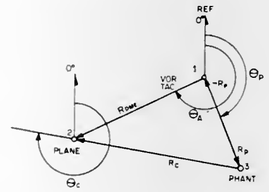


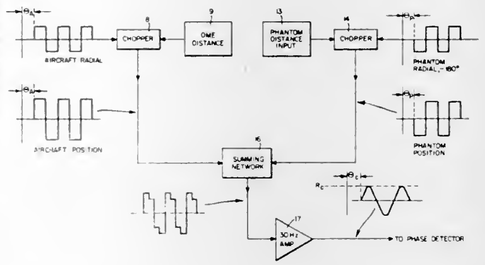
A special purpose digital computer matches orders and establishes market prices in an auction market for fungible goods. Priced orders to buy are arranged in descending order by price and priced orders to sell are arranged in ascending order by price within each price range, all orders are arranged in descending order by time of placement so that the older orders are uppermost. All compatibly priced orders are then matched starting with the highest priced order to buy and the lowest priced order to sell and proceeding sequentially until all compatibly priced pairs of orders have been matched. The prices accompanying the last pair of orders to be matched are then used to establish a trading price for all of the matched pairs and a new market price for future transactions. Unpriced or "at market" orders are assigned prices based upon the market price, unless the market price is substantially below the prices of all priced buy orders or substantially above the price of all priced sell orders, in which case the unpriced orders are not assigned prices until a new market price has been established.

3,581,073
ELECTRONIC COURSE LINE COMPUTER

Wilbur A. Visher, Ambler, Pa., assignor to Narco Scientific Industries, Inc., Fort Washington, Pa.

Filed Feb. 17, 1969, Ser. No. 799,743
Int. Cl. G06g *7/22, 7/78;* **G01s** *7/46*
U.S. Cl. 235—150.26 **12 Claims**





A method of electronically computing navigational course lines and apparatus for carrying out said method is disclosed, whereby a first vector representation of the aircraft location with respect to a VORTAC station is electronically generated by using the VOR signal to control a chopper circuit which acts on the DME distance voltage; a second vector representation of the location of the destination point with respect to the VORTAC is electronically generated in a similar manner, the bearing and distance information being introduced manually by the pilot; the inverse of said second vector is generated; and said first vector representation and said inverse of said second vector representation are electronically added to obtain a third vector representation of the aircraft location with respect to the destination point. Such third vector representation is then compared with a manually adjusted reference signal to provide course direction control, and is processed to provide range information.

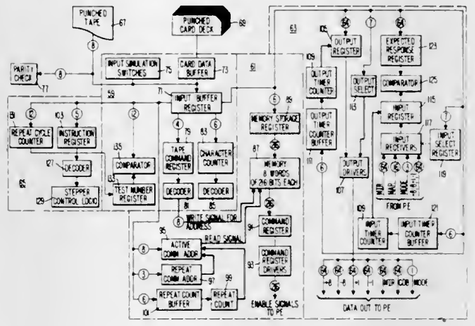
3,581,074
AUTOMATIC CHECKOUT APPARATUS

Richard B. Waltz, King of Prussia, Pa., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 19, 1968, Ser. No. 706,268
Int. Cl. G01f *31/30;* **G06f** *11/04*
U.S. Cl. 235—153 **9 Claims**

Apparatus for operationally testing a computer component (i.e. a subsystem of a data processing system) which apparatus includes a memory for storing sets of enable signals

to be transmitted to the computer component under test, and means for transmitting the enable signals to the computer component for causing it to perform operations on data. Also included are register means for storing a data word for transmission to a selectable portion of the computer component at a selectable time during a test, register means for receiving a data word from a selectable portion of the computer com-

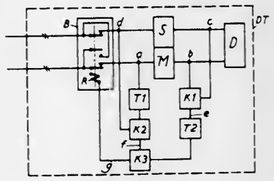


ponent for comparison with an expected value and stepper control logic for controlling the operation of the apparatus. The sets of enable signals to be sent to the computer component, control words for controlling the operation of the apparatus and data words for said register means are fed into an input buffer register from punched tape or a card deck for distribution to the proper parts of the apparatus.

3,581,075
ARRANGEMENT FOR DISCONNECTING A DEFECTIVE LOCAL CONCENTRATOR IN A DATA TRANSMISSION SYSTEM

Orjan Mats Mattsson, Taby, and Walter Herbert Ewin Widl, Bandhagen, both of, Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Mar. 25, 1969, Ser. No. 810,321
Claims priority, application Sweden, Apr. 18, 1968, 5174/1968
Int. Cl. G08c *25/00;* **G06f** *11/00*
U.S. Cl. 235—153 **1 Claim**

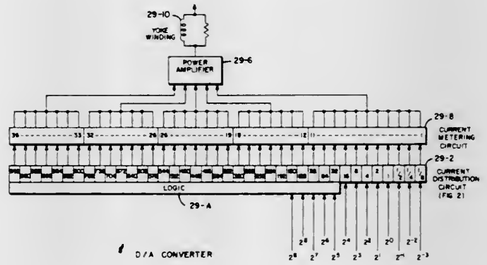


In a data transmission system comprising a number of remote terminals connected in series to a main terminal via a data transferring line inquiries are cyclically sent out from the main terminal to the respective remote terminals. If a fault occurs in a terminal this will affect the whole system. Accordingly each terminal is provided with a shunting arrangement which disconnects a faulty terminal without affecting the rest of the system.

3,581,076
DIGITAL TO ANALOG CURRENT DISTRIBUTION CIRCUIT

Mauritz L. Granberg, Minneapolis, and Hubert W. Mueller, Jr., Hamburg, both of, Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Division of Ser. No. 569,481, Aug. 1, 1966, Pat. No. 3,510,634, May 5, 1970. This application July 17, 1969, Ser. No. 871,162
Int. Cl. H03k *13/04*
U.S. Cl. 235—154 **1 Claim**

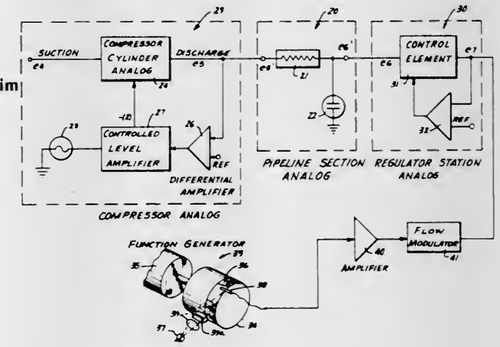


A current distribution circuit suitable for use in a digital-to-analog converter in which digital signals are applied either directly or through a logic network to selected flip-flop stages such that the flip-flops produce a number of output signals which individually represent a given increment of current. These current increments are made available to a resistive ladder type current metering circuit to produce the desired analog voltage.

3,581,077
ELECTRICAL ANALOG MODEL FOR FLUID FLOW TRANSMISSION SYSTEM

Glenn Damewood; Cecil R. Sparks, and James D. King, all of San Antonio, Tex., assignors to Southern Gas Association, San Antonio, Tex.

Filed July 1, 1968, Ser. No. 741,528
Int. Cl. G06g *7/57;* **H03h** *7/36*
U.S. Cl. 235—184 **18 Claims**



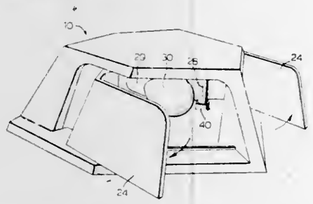
An electrical analog model for simulating fluid flow characteristics in a pipeline flow system, such as a gas transmission system, wherein the analog includes a source of electrical voltage proportional to inlet fluid pressure, a compressor station analog, a plurality of pipeline section analogs, a regulator station analog, and a flow transient or load utilization simulator. The compressor station analog includes a capacitor pump, a source of alternating current for driving the capacitor pump, a controlled-level amplifier for controlling the drive to the capacitor pump, and a differential

amplifier responding to changes in the output of the capacitor pump and driving the controlled level amplifier. Each line section analog is a delay line including a nonlinear resistance element, such as a field effect transistor having a resistance proportional to the current passing through it, and a nonlinear voltage variable capacitance diode having a capacitance proportional to the inverse square root of impressed voltage. The regulator analog is a voltage regulator including a control element, such as a field effect transistor, and a differential amplifier responding to changes in regulator analog output voltage to drive the field effect transistor. The transient and load utilization simulator includes a function generator programmed by an opaque tape to simulate fluid withdrawal. The tape controls the amount of light between a light source and a light sensor which produces an output current in response to light. The output current produced is impressed on the electrical analog system by a flow modulator, such as by modulating the regulator station output with this current.

3,581,078
FAST FOURIER ANALYZER
George H. Robertson, Summit, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Nov. 24, 1967, Ser. No. 685,648
Int. Cl. G06g *7/19;* **G01r** *23/16*
U.S. Cl. 235—193 **10 Claims**

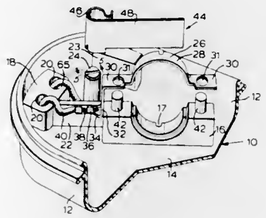
The recursive equations of the Cooley-Tukey algorithm are implemented in analog form, thereby significantly decreasing the time needed to compute either the Fourier transform or the inverse Fourier transform of a signal segment, relative to the time needed for the same computation by a digital implementation of these equations.

3,581,079
MARINE RUNNING LIGHT CONSTRUCTION
Hugo Magi, Etobicoke, and John Smith, Willowdale, Ontario, Canada, assignors to Aqua-Marine Manufacturing Limited, Toronto, Ontario, Canada
Filed Oct. 2, 1969, Ser. No. 863,089
Int. Cl. B63b *45/04*
U.S. Cl. 240—7.5 **6 Claims**



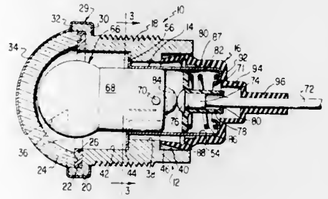
The combination of a lamp housing and a pivotally mounted lens, the latter being adapted to swing between an open and a closed position. The lens has a resilient arm extending outwardly from the lens away from the pivot axis, with a bearing edge adapted to sweep through an arc adjacent an inner face of the housing. The face has a cam surface following the arc, such that the bearing arc is biased toward one end or the other of the cam surface, corresponding to the open and closed positions of the lens.

3,581,080
LAMP HOUSING AND ELECTRIC TERMINAL CONSTRUCTION
Hugo Magi, Etobicoke, Ontario, Canada, assignor to Dominion Auto Accessories Limited, Toronto, Ontario, Canada
Filed Apr. 18, 1969, Ser. No. 817,400
Int. Cl. B60q *1/32;* **H01r** *33/48*
U.S. Cl. 240—8.2 **7 Claims**



A lamp housing in which a crook-shaped terminal is looped around a split pin through which the bared end of an electric wire is inserted, so that the terminal contacts the bared end. One projecting part of the terminal is biased toward the center contact of an electric bulb by reason of another projecting part thereof bearing against a portion of the housing.

3,581,081
AUTOMOTIVE LICENSE LAMP ASSEMBLY
Lawrence E. Rieth, Springfield, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed Aug. 11, 1969, Ser. No. 849,079
Int. Cl. B60q *1/30*
U.S. Cl. 240—8.3 **10 Claims**

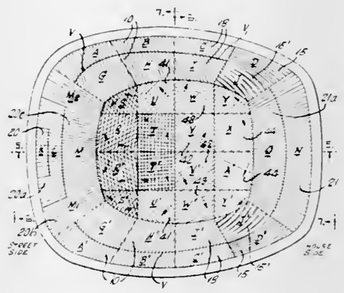


A lamp is removably carried by an open J-slot socket which is concentrically positioned within a cylindrical bushing. The socket is positively locked in place and resiliently sealed against the bushing by a unitary rubber boot which covers the rearward portion of the socket and is compressed between the socket and the bushing.

3,581,082
STREET LIGHTING LUMINAIRE REFRACTOR
Jan Shadwick, Newark, Ohio, assignor to Holophane Company, Inc., New York, N.Y.
Filed Aug. 9, 1968, Ser. No. 751,468
Int. Cl. F21v *5/00*
U.S. Cl. 240—106 **14 Claims**

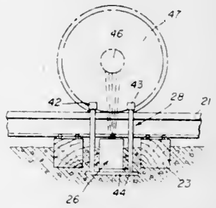
In a tilted oval street luminaire, a refractor for use with a physically oval, but optically round, reflector provides four

substantially uniform light beams for intersection lighting. Vertical prisms in the forward beam sections of the refractor and vertical and horizontal prisms in the rear beam sections of the refractor provide the basic four way distribution from a tilted reflected beam which, because of reflector design considerations may be horseshoe-shaped or annular. Some or all of the vertical prisms may have their normally inactive or intermediate surface oriented to receive light to balance the candlepower as between the front and rear beams and horizontal prisms acting in conjunction with the vertical prisms lower the reflected and lateral refracted beams. Front and rear radial prisms redirect incident direct light and reflected plus direct light respectively, into the front and rear



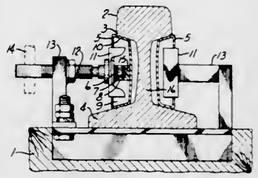
streets, the latter radial prisms building the below beam component in the rear streets. The bottom of the refractor provides four basic sections of variously oriented prisms on the incident surface, further subdivided into four further sections each to split the direct and reflected light from underneath the unit and uniformly distribute it over the entire intersection. Longitudinal flutes centrally located on the outer surface below the inside bottom sections, and a checkerboard pattern of crossing flutes on the lower portion of street side outer surface coact with the inside prisms to break up the strong component of reflected light while paying due respect to the direct light to confine the down light within the intersection.

3,581,083
WHEEL TRIP
Ivan L. Joy, 1616 W. 29th St., Topeka, Kans.
Division of Ser. No. 665,329, Sept. 5, 1967, Pat. No. 3,461,284. This application Aug. 11, 1969, Ser. No. 848,922
Int. Cl. B61l *1/10*
U.S. Cl. 246—246 **6 Claims**



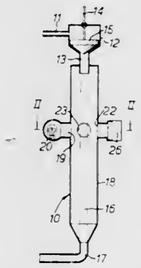
This disclosure deals with a wheel trip adapted to be mounted adjacent a length of railroad track and to indicate the presence or the passing of the wheels on one side of a train. The wheel trip includes two spaced sensors, means for energizing the two sensors, each of the sensors responding to the presence of a wheel, and means connected in circuit with the sensors for generating a trip signal only when a wheel is adjacent both sensors. A counter and/or a temperature measuring unit may be connected to respond to the trip signal

3,581,084
PIEZOELECTRIC WHEEL-AXLE DETECTOR
Saburo Kaneno, Terahata, Kawanishi; Takeshi Yamaguchi, Suita, Osaka, and Shunichi Yoshioka, Takarazuka, all of, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan
Filed Nov. 6, 1968, Ser. No. 773,765
Claims priority, application Japan, Nov. 10, 1967, 42/71965
Int. Cl. B61l *13/04*
U.S. Cl. 246—249 **13 Claims**



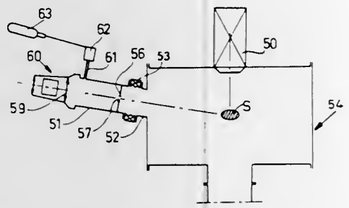
A wheel-axle detector for wheeled vehicles following a track having rails with an I-shaped cross section forming a continuous imperforate web with an opposed overhanging head and foot. A piezoelectric element holder containing a piezoelectric element is inserted directly between the head and the foot of the rail such that a portion of the vehicle wheel load borne on the rail is imparted to the element. A detecting circuit is provided to receive and detect the electrical output of the piezoelectric element.

3,581,085
ULTRAVIOLET FLUORESCENT ANALYZER FOR MONITORING OF OIL IN DISCHARGE BALLAST
Sonja I. Barrett, Middle Farm, Watereaton, Oxford, Oxfordshire, England
Filed May 20, 1968, Ser. No. 730,253
Claims priority, application Great Britain, May 26, 1967, 24592/67
Int. Cl. G01n *21/26*
U.S. Cl. 250—43.5 **16 Claims**



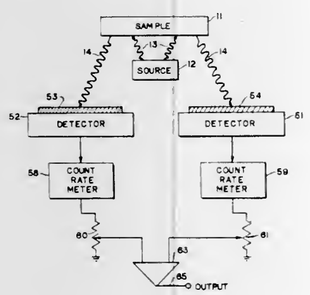
A continuous monitoring system for measuring the oil content of discharged ballast water based on the use of an ultraviolet fluorescence meter. The meter operates by passing ultraviolet light through a sample jet of water, the fluorescent visible light being measured by a filter-photocell combination angled to the incident beam. At elevated oil concentrations, the meter response diminishes as both ultraviolet and visible light are cut off by the increasing amounts of dark oil present, thus giving a false reading. A photocell or fluorescent indicator screen is therefore proposed as a warning device to be used in conjunction with the above monitoring system, to indicate when the emerging ultraviolet light is obscured by excess quantities of oil.

3,581,086
DEVICE FOR THE SUPERVISION OF A TREATMENT IN AN ENCLOSURE AT VERY LOW PRESSURE
Bernard M. Daigne, Malakoff, and Louis Pelletier, Sainte-Genevieve Des Bois, France, assignors to Office National D'Etudes Et De Recherches Aerospatiales (par abreviation O.N.E.R.A.)
Filed Mar. 18, 1968, Ser. No. 713,921
Claims priority, application France, Mar. 21, 1967, 99648
Int. Cl. G01n *23/22*
U.S. Cl. 250—49.5 **13 Claims**



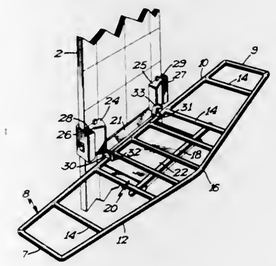
A device for supervising a thermal treatment operation taking place inside a vacuum enclosure by detecting and/or measuring emitted radiation accompanying the operation comprises a compartment maintained at a higher pressure substantially closed at one end by a partition located inside the enclosure and having an opening for passing radiation from the enclosure to a radiation sensitive element closing the compartment at its other end, the size of the opening and the distance between the partition and the radiation sensitive element being such that, for the value of the pressure in the compartment, substantially no vapor molecules originating from the enclosure during the operation reach the sensitive element. The operation may for example comprise an electron gun bombarding a weld region within the enclosure.

3,581,087
X-RAY FLUORESCENCE MEASURING SYSTEM EMPLOYING BALANCED X-RAY FILTERS AND CIRCUIT MEANS TO VARY THE EFFECTIVE RELATIVE TRANSMISSION THEREOF
Joris M. Brinkerhoff, Arlington; Jean Hunerwadel, Hingham, and Francis B. Sellers, Sudbury, all of, Mass., assignors to Panametrics, Inc., Waltham, Mass.
Filed Oct. 25, 1968, Ser. No. 770,615
Int. Cl. H05g *3/00;* **G01m** *23/22*
U.S. Cl. 250—51.5 **4 Claims**



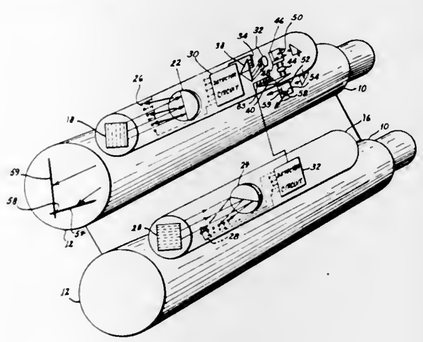
An X-ray fluorescence analysis system for measuring the amount of a specific element in a matrix containing variable amounts of other elements. The system employs a pair of balanced filters and a detector and counting apparatus. One filter has an absorption edge above the characteristic X-ray energy of the specific element and the other has its absorption edge below that energy. The apparatus is arranged so that with one filter in place the number of rays received by the detector for a time τ is accumulated and with the other filter in place the number of rays detected for a fraction $F\tau$ of that time is subtracted from the first number, the difference representing the quantity of specific element present.

3,581,088
X-RAY TABLE ATTACHMENT
Edward P. Engels, Weiner Memorial Hospital, Marshall, Minn.
Filed Aug. 15, 1968, Ser. No. 752,962
Int. Cl. G01n *23/04*
U.S. Cl. 250—55 **3 Claims**



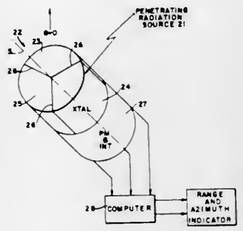
A body-supporting frame adapted to be removably attached to a vertically oriented X-ray table in a horizontal position for the purpose of obtaining horizontal beam decubitus X-ray films of a patient's chest, abdomen, or extremities. Special bracket detents secured to the footrest of a standard, upright X-ray table may be utilized to slidably and removably support the aforesaid body rest frame on said footrest.

3,581,089
CATADIOPTRIC REFLEX RADIATION DETECTION CONVERSION, LOCATION AND DISPLAY DEVICE
Leonard J. Craig, Carpinteria, Calif., assignor to The United States of America as represented by the Secretary of Air Force
Filed June 25, 1969, Ser. No. 836,395
Int. Cl. G01t *1/00*
U.S. Cl. 250—83R **4 Claims**



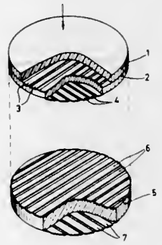
A system for detecting and locating short duration radiant energy pulses occurring in the nonvisible portions of the spectrum by converting each event of pulsed energy within a region of an observer's field of view to a visible pair of distinctive orthogonal lines intersecting over the source of radiation including a pair of apertures, toric reflectors with mutually orthogonal principal axes reflecting the incident radiation on a pair of linear arrays of photosensitive detectors, and detector circuits for illuminating corresponding optoelectric members and an optical system for projecting the visible light before an observer's eyes.

3,581,090
UTILIZING PENETRATING RADIATION
Leonard Carlton Brown, Columbus, Ohio
Filed Oct. 20, 1966, Ser. No. 588,199
Int. Cl. G01t *1/20;* **G01s** *5/16*
U.S. Cl. 250—83.3 **16 Claims**



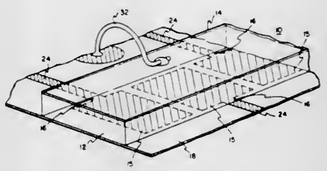
A system for determining the position of a plurality of objects carrying sources of radiation relative to a detector for said radiation includes means for modulating each of the radiation sources at a different frequency. The modulated radiation is received by an array including a plurality of mutually shielded detectors. Each detector feeds a voltage indicative of the amount of penetrating radiation impinging thereon to a computing network which derives visual signals indicative of the angular location and range of each object carrying a radiation source. Provision is made for eliminating background radiation from the signal derived from each of the detectors.

3,581,091
NEUTRON SPECTROMETER EMPLOYING TWO SEMICONDUCTOR COUNTERS IN COMBINATION WITH A COINCIDENCE CIRCUIT FOR ELIMINATING BACKGROUND
Albertus Cornelis Meijer, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sept. 3, 1968, Ser. No. 756,751
Claims priority, application Netherlands, Sept. 15, 1968, 6712684
Int. Cl. G01t *3/00*
U.S. Cl. 250—83.1 **2 Claims**



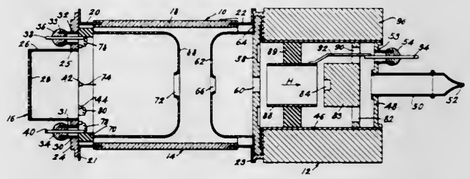
A hydrogen rich foil is arranged at right angles to a beam of neutrons to be measured and emits protons which are interrupted and counted by a semiconductor barrier layer transmission counter (dE/dx—counter) and a semiconductor absorption or output counter (E—counter which count the protons and measure the energy, background being eliminated by a coincidence counter. Both the transmission counter and absorption counter consists of a checkerboard counter and the scattering foil is arranged substantially immediately against the transmission counter, the scattered protons being measured by means of the coincidence circuit not only according to their number and energy, but also according to their direction.

3,581,092
PYROELECTRIC DETECTOR ARRAY
Denton Pearsall, Stamford, Conn., and Gerald Jankowitz, Hillsdale, N.J., assignors to Barnes Engineering Company, Stamford, Conn.
Filed Apr. 9, 1969, Ser. No. 814,761
Int. Cl. G01t *1/16*
U.S. Cl. 250—83.3 **5 Claims**



An array of thermal detectors for infrared radiation measurement is fabricated on a single piece of pyroelectric material. A common transparent electrode to the infrared radiation is applied thereto and positioned on one side of the layer of pyroelectric material facing the incident radiation, and a plurality of individual field-defining electrodes are mounted on the other side of the pyroelectric material. This structure is simpler and more reliable than an assembly of isolated detectors and is easier to fabricate by using vacuum-deposited leads on the mounting substrate.

3,581,093
DC OPERATED POSITIVE ION ACCELERATOR AND NEUTRON GENERATOR HAVING AN EXTERNALLY AVAILABLE GROUND POTENTIAL TARGET
Barney J. Carr, deceased, late of Colorado Springs, Colo. (by Elisabeth Helen Carr, administratrix), assignor to Kaman Sciences Corporation, Colorado Springs, Colo.
Continuation-in-part of application Ser. No. 363,064, Apr. 23, 1964, now Patent No. 3,393,316, dated July 16, 1968.
This application Apr. 23, 1968, Ser. No. 723,632
Int. Cl. G21g *3/00;* **G21h**
U.S. Cl. 250—84.5 **12 Claims**

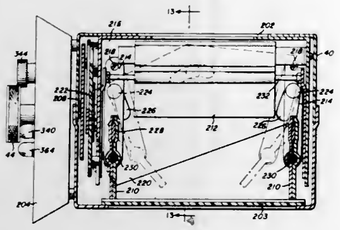


Sealed neutron generator containing an isotope of hydrogen having an ion source, an accelerator and a target containing a substance which reacts with impinging ions to produce neutrons maintained at ground potential and located to be available at the exterior of the generator.

3,581,094
X-RAY APPARATUS
Leonard F. Peyser, Briarcliff Manor, N.Y., and Gordon F. Baror, Norwalk, Conn., assignors to The Machlett Laboratories, Incorporated, Springdale, Conn.
Filed Nov. 7, 1968, Ser. No. 774,106
Int. Cl. G03b *41/16*
U.S. Cl. 250—105 **10 Claims**

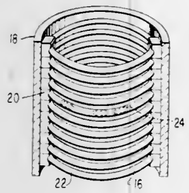
X-ray apparatus for preventing overexposure of a subject to X-radiation by limiting the size of the irradiated area to conform substantially to the size of any one of a number of predetermined selected film sizes. This is achieved by an electrical system for compiling and integrating information indicative of the longitudinal and lateral dimensions of the

film area, the distance between the film and the X-ray tube, and the size of the cone of radiation as established by adjusted collimation of the X-ray beam. The electrical system functions to effectively permit operation of the X-ray tube



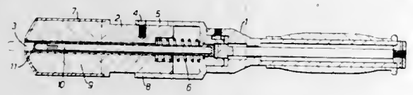
when integrated information indicates that the various components of the apparatus are properly adjusted so that the size of the cone of radiation and, consequently, of the irradiated area conforms substantially to the size of a film being used.

3,581,095
SOURCE PLAQUE FOR AN IRRADIATION CHAMBER OF CURVILINEAR CROSS SECTION
Jackson A. Ransohoff, Bethesda, and James J. Hairston, Jr., Rockville, Md., assignors to Neutron Products, Inc., Washington, D.C.
Filed July 17, 1967, Ser. No. 653,899
Int. Cl. G21h *5/00*
U.S. Cl. 250—106 **2 Claims**



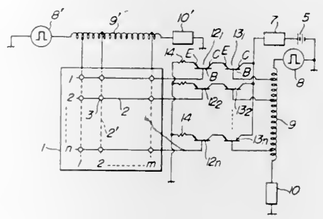
An elongated tubular source plaque for an irradiation chamber of curvilinear transverse cross section is formed by elongated radiation source members curved to the same curve as the curvilinear section of the irradiation chamber, and the members are spaced apart along the axis of the chamber. Each member is a tube filled with a number of individual sources may be connected end to end to form an annulus, or formed as a helix to provide the tubular source plaque. The members may be of uniform or nonuniform dosage and the spacing of the members may be regular or irregular, and may further be adjustable.

3,581,096
DEVICE FOR CONTROLLING EXPOSURE FROM A RADIOACTIVE SOURCE
George A. Seward, 12 Flaunden Lane, Bovingdon, England
Filed Sept. 3, 1968, Ser. No. 756,970
Int. Cl. G21f *5/02*
U.S. Cl. 250—106 **9 Claims**



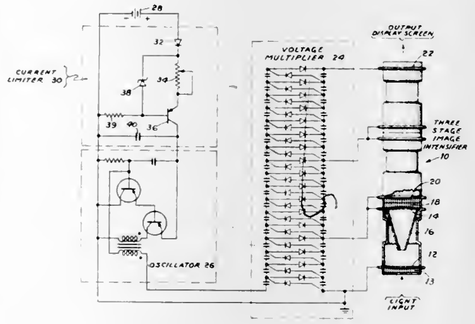
A device is disclosed for controlling the exposure from a radioactive source by removably positioning a radiating pellet within a bore in a shielding material in a handle-operated telescoping torch arrangement which can be stored in disassembled form in a protective container.

3,581,097
SOLID-STATE IMAGE PICKUP DEVICE
Masao Hibi, and Takeshi Nishimura, Kodaira-Shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 13, 1967, Ser. No. 622,773
Claims priority, application Japan, Mar. 16, 1966, 41/15,762
Int. Cl. H01j *39/12;* **H04n** *3/14*
U.S. Cl. 250—209 **7 Claims**



The solid-state image pickup device is equipped with a radiation-sensitive surface formed with a plurality of radiation-sensitive elements disposed in a matrix form, two groups of conductive strips for impressing scanning pulses to said radiation-sensitive elements, first scanning-pulse-distributing means connected to one of said two groups of conductive strips, second scanning-pulse-distributing means connected, via transistors having switching action, to the other of said two groups, and a detector for deriving, as electric signals, the changes in the characteristics of said radiation-sensitive elements.

3,581,098
AUTOMATIC BRIGHTNESS CONTROL
Alan W. Hoover, Hollins, Va., assignor to International Telephone and Telegraph Corporation, Nutley, N.Y.
Filed Feb. 24, 1969, Ser. No. 801,633
Int. Cl. H01j *31/50*
U.S. Cl. 250—213 **7 Claims**



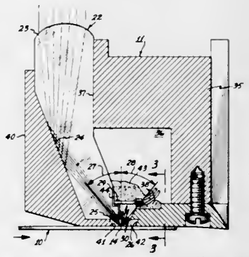
The brightness of a phosphor display screen of an image intensifier tube is automatically controlled by a current-limiting device connected between a direct current source and an oscillator which supplies an alternating voltage to a voltage multiplier, the latter in turn applying a direct accelerating voltage between the input photocathode and output display screen of the tube. The current-limiting device acts to provide a relatively constant current when the input light intensity and corresponding output current of the display screen increase to a predetermined level.

3,581,099
TORIC IMAGING LENS FOR SLOT CENSORS FOR SATELLITES
Georg G. F. Franke, Wetzlar, Germany, assignor to Ernst Leitz GmbH, Wetzlar, Germany
Filed Mar. 7, 1968, Ser. No. 711,314
Claims priority, application Germany, Mar. 10, 1967, L55,966;IXa/42h
Int. Cl. H01j *3/14, 5/16;* **G02b** *3/06, 13/01*
U.S. Cl. 250—216 **4 Claims**

Five embodiments of slot sensors for stabilizing the position of a satellite in space are disclosed. All embodiments comprise a glass body having a refractive circumferential surface of 180° angular aperture. In the image plane of the refractive surface is disposed a slot diaphragm, the slot of which is arranged to coincide with the center plane of said glass body. Behind the slot diaphragm there is provided a photoelectric receiver which is sensitive to the electromagnetic rays which are incident on the sensor.

In the different embodiments the slot diaphragms are shown to be positioned either in front of or behind the center of rotation of the toric glass body (in the direction of light travel) depending on the radius of the toric shape and on the refractive index of the glass.

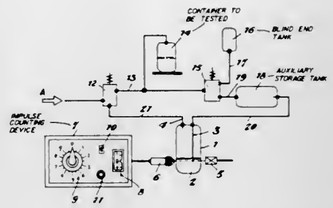
3,581,100
OPTICAL READING DEVICE
Richard E. Milford, Phoenix, Ariz., assignor to Honeywell Information Systems Inc.
Filed Oct. 3, 1968, Ser. No. 764,890
Int. Cl. G08c *9/06*
U.S. Cl. 250—216 **4 Claims**



An optical read head for record-reading electronic equipment which senses and generates signals in response to marks on documents as the documents are transported along a given path.

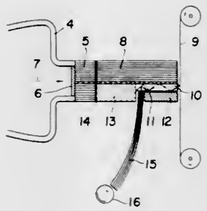
3,581,101
PHOTOELECTRIC BUBBLE METER FOR CHECKING GASTIGHT CONTAINERS AND THE LIKE
Teodorico Neeff, 38 Via Gran Sasso 20141, Milan, Italy
Filed July 1, 1969, Ser. No. 838,208
Claims priority, application Italy, July 13, 1968, 18930A/68
Int. Cl. G01h *21/26*
U.S. Cl. 250—218 **2 Claims**

The disclosure relates to a device for checking the gastightness of containers and the like. The device essentially comprises: a transparent jar containing a liquid and provided with an inflow tube dipping in said liquid and an outflow tube terminating above the surface of the liquid, said inflow tube being directly or intermediately with the container to be tested; a projector outside the transparent jar adapted to transmit a horizontal beam towards the end of the dipping tube; a photocell diametrically opposed to the projector and adapted to reveal the eventual bubbles originated by leaks in



the tested container and issuing from the dipping tube; and an impulse counting device adapted to count the bubbles revealed by the photocell.

3,581,102
PHOTOELECTRIC AND ELECTRIC LIGHT CONVERSION ELEMENT
Kazuyoshi Nagao, Kanagawa-ken, Japan, assignor to Canon Camera Co., Ltd., Tokyo, Japan
Filed Dec. 26, 1968, Ser. No. 787,058
Claims priority, application Japan, Jan. 8, 1968, Jan. 8, 1968, 43/23811;43/985
Int. Cl. G02b *5/16*
U.S. Cl. 250—227 **10 Claims**

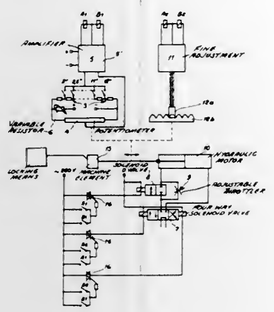


In photoelectric transducing apparatus of the type having an electron beam scanning a surface coated with electron activated light emitting material to convert graphic information into electrical output signals, or modulated in accordance with electrical input signals to convert the input signals into graphic information, a light transmitting means comprises a plurality of optical fibers fused together in juxtaposed relation to form a plate having a solid, voidless cross section of the optical fibers. The light transmitting means may comprise a plate severed from the fused fibers and fritted to the surface of a cathode-ray tube, in combination with a light transmitting channel formed of the fused optical fibers. The end faces of the channel may be formed either by cutting perpendicular to the lengths of the fibers or by cutting at an angle to such perpendicular.

3,581,103
ARRANGEMENT FOR THE ADJUSTMENT OF THE POSITION OF MOVABLE MACHINE ELEMENTS
Aarne Olavi Makela, Karhula, Finland, assignor to A. Ahlstrom Osakeyhtio, Noormarkku, Finland
Filed Dec. 30, 1968, Ser. No. 787,870
Claims priority, application Finland, Jan. 3, 1968, 13/68
Int. Cl. G05b *13/02;* **G01d** *5/34*
U.S. Cl. 250—231 **4 Claims**

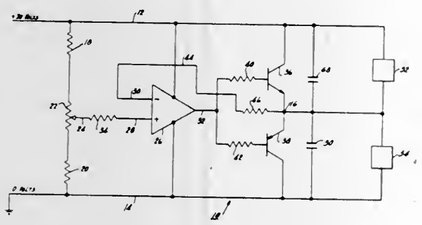
The invention is particularly applicable for the adjustment of an edge trimming saw by remote control, wherein the number of positions into which the machine element is to be adjusted is small. There is described a nonlinear system comprising a coarse adjustment for transferring the element to

the vicinity of the desired point at a high velocity and a fine adjustment to transfer the body at a low velocity toward its



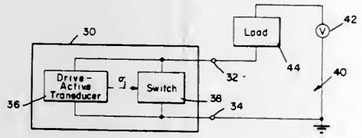
final position. The fine adjustment is effected by a photocell device and a toothed strip of opaque material.

3,581,104
VOLTAGE SPLITTER CIRCUIT
Donald G. Thew, Milwaukee, Wis., assignor to Hornischfeger Corporation, West Milwaukee, Wis.
Filed Mar. 5, 1970, Ser. No. 16,827
Int. Cl. H02j *1/14, 3/46*
U.S. Cl. 307—15 **5 Claims**



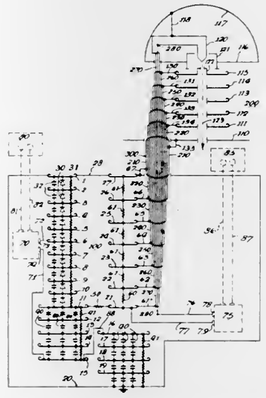
A voltage splitter circuit provides a terminal voltage equal to half the voltage impressed across a pair of voltage busses. The voltage at the intermediate terminal may be used to provide two equal, but opposite, voltages between the intermediate terminal and each of the busses. The intermediate terminal is located between the output circuits of two complementary transistors connected across the busses. The transistors are operated by an amplifier driven by a voltage divider. A feedback circuit exists between the intermediate terminal and the input of the amplifier to stabilize the circuit.

3,581,105
SWITCHING APPARATUS
David B. Gish, Pasadena, Calif., assignor to Bell & Howell Company, Chicago, Ill.
Filed Sept. 23, 1968, Ser. No. 761,698
Int. Cl. H01h *35/00*
U.S. Cl. 307—116 **13 Claims**



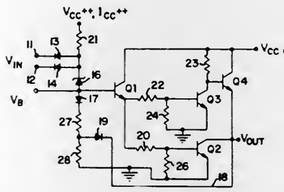
A two-terminal switching apparatus which includes a transducer requiring drive energization for producing a sensing capability. The transducer and a switch are parallel connected across the terminals, and one of the terminals is connectable to a source of electrical energy through an external load, while the other terminal is connectable to common. A preset voltage difference appears across the terminals when the switch is conducting, which voltage difference is sufficient to permit transducer drive continuity.

3,581,106
GRADED PLANE, HIGH VOLTAGE DC POWER SUPPLY
Joseph T. Peoples, and Charles C. Landry, Austin, Tex., assignors to Nuclear-Chicago Corp., Des Plaines, Ill.
Filed Apr. 5, 1968, Ser. No. 719,107
Int. Cl. H02j *5/00*
U.S. Cl. 307—150 **7 Claims**



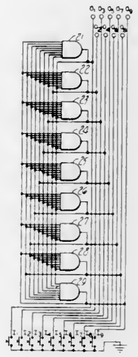
A high voltage electron accelerator system employing a graded plane power supply, a graded plane accelerator, and a single, graded-conductor cable interconnecting the power supply and the accelerator.

3,581,107
DIGITAL LOGIC CLAMP FOR LIMITING POWER CONSUMPTION OF INTERFACE GATE
Einer Dale Nielsen, Los Gatos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.
Filed Mar. 20, 1968, Ser. No. 714,645
Int. Cl. H03k *19/36, 5/08*
U.S. Cl. 307—215 **3 Claims**



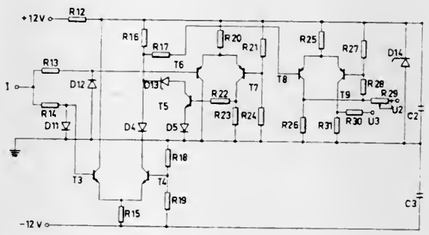
A NAND-type logic gate for interfacing high voltage logic levels with a low level output. Feedback means including a diode are coupled between the base input of an amplifier which is coupled to the input logic terminals and the output. The feedback functions to clamp the input of the amplifier to a relatively low voltage to cause a dropping resistor between the high voltage power supply and the base input of the amplifier to have an increased voltage drop with increased power supply voltage to thus maintain the drive of the amplifier substantially constant. On the other hand, the feedback path is also coupled to ground through an output transistor to thus reflect load current changes to allow the drive voltage to the amplifier to increase in response to increased drive requirements. The diode in the feedback path provides for nonlinearity to thus prevent oscillations.

3,581,108
SINGLE OUTPUT SELECTING CIRCUIT EMPLOYING A PLURALITY OF INTERLOCKED NOR-GATES
Irving V. Eisenmenger, Burlington, N.C., assignor to Western Electric Company, Incorporated, New York, N.Y.
Filed Dec. 5, 1968, Ser. No. 781,359
Int. Cl. H03k *19/34*
U.S. Cl. 307—215 **3 Claims**



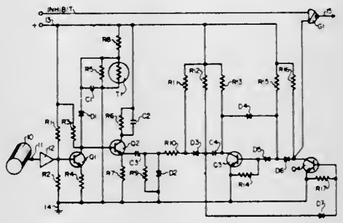
A plurality of NOR gates are arranged with the output of each gate connected to an associated output terminal and to an input of every other gate. Energization of a selected output terminal, inhibits the operation of each gate other than the one associated with the selected output terminal thereby latching the one associated with the selected terminal in an energized condition and the nonselected terminals in a nonenergized condition.

3,581,109
CIRCUIT SYSTEM FOR PRODUCING AN OUTPUT SIGNAL FROM A VARIABLE AMPLITUDE SIGNAL WHEN THE AMPLITUDE OF SAID SIGNAL IS WITHIN A SELECTED RANGE
Tore Bertil Reinhold Olsson, and Ake Valentin Nilsson, Karlskoga, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden
Filed Oct. 23, 1967, Ser. No. 677,122
Claims priority, application Sweden, Apr. 3, 1967, 4615/67
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 **12 Claims**



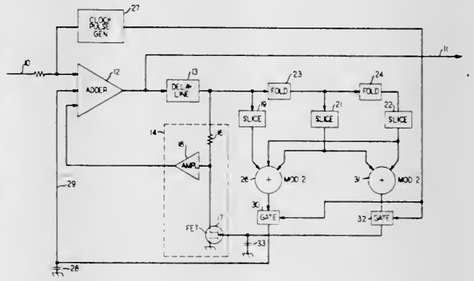
There is disclosed a system for selecting and indicating the amplitude of the electron beam of a cathode-ray tube, and more particularly, a system in which a definite relationship is maintained between the output signal of a heat radiation sensitive detector and the intensity of heat radiations received by the detector. As a result, the amplitude of the output signal of the detector has a definite relationship to the temperature at the point of origin of the heat radiation. The system also includes means for accurately determining the specific area within a larger area from which heat radiation within a specific range of temperature originates.

3,581,110
APPARATUS FOR EVALUATING SIGNALS READ FROM MAGNETIC MEDIUM
Richard J. Belcastro, Addison, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Feb. 17, 1969, Ser. No. 799,704
Int. Cl. H03k *5/08*
U.S. Cl. 307—237 **5 Claims**



A two-stage transistorized, magnetic drumhead readout amplifier including a positive signal limiter and a negative signal limiter, followed by an excursion detector arranged to pass only that portion of a signal that swings from the positive to the negative direction, and then only of a predetermined magnitude. The passed signal is shaped by a monostable multivibrator prior to application to suitable logic circuitry.

3,581,111
ADAPTIVE INTEGRATOR FOR DIGITAL SIGNALS
Ernest R. Kretzmer, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Sept. 16, 1968, Ser. No. 759,848
Int. Cl. G06g *7/18*
U.S. Cl. 307—236 **4 Claims**

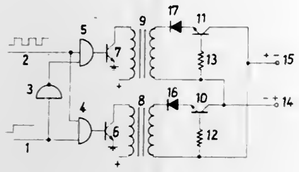


An integrator circuit is described in which a received signal is added to a feedback signal. The feedback signal is generated by delaying the sum of the received signal and the feedback signal. The amplitude and DC levels of the feedback signal are controlled by circuits which sense the deviation of the sum signal from predetermined levels.

3,581,112
ELECTRONIC RELAY
Peter Laderach, Worb, Switzerland, assignor to Hasler AG, Berne, Switzerland
Filed Jan. 31, 1969, Ser. No. 795,491
Claims priority, application Switzerland, Feb. 5, 1968, 1643/68
Int. Cl. H03k *17/00*
U.S. Cl. 307—241 **5 Claims**

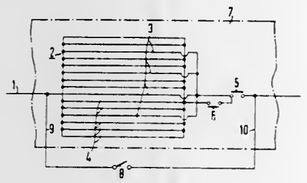
An electronic relay with one input for the reception of one binary signal, with means for applying an alternating voltage or a pulse voltage, having a frequency which is high relative to the keying frequency, to one of two transformer primaries

on at least one transformer having at least one transformer secondary which is DC isolated from the aforementioned input and from the supply voltage sources, with means for rectifying the alternating voltage signal and with one output for delivering a DC voltage whose polarity depends on the



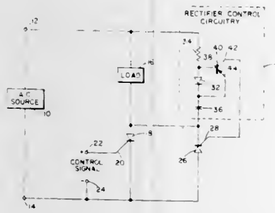
state of the input signal, the connections between the transformer secondary and the relay output being provided via the emitter-collector connections of two transistors, which are driven by currents derived from the transformer secondary and applied to the base.

3,581,113
SWITCHING DEVICE FOR DISCONNECTING CABLES
Wilhelm Kafka, Tennenlohe, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany
Filed July 25, 1968, Ser. No. 747,684
Claims priority, application Germany, Aug. 4, 1967, S111185 VIIId/21c
Int. Cl. H01v *11/10, 11/16*
U.S. Cl. 307—245 **14 Claims**



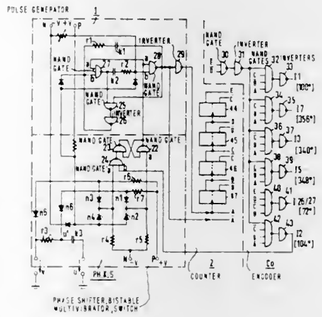
A switching device for disconnecting superconductive current-carrying cables has a superconductive circuit which provides a high resistance in the normal conducting state. A control mechanism is provided for transferring the superconductive circuit from the superconducting state to the normal conducting state.

3,581,114
SCR SLAVING CIRCUIT
Robert E. Gregson, Scottsdale, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Sept. 3, 1968, Ser. No. 756,972
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 **5 Claims**



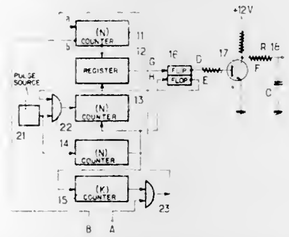
An SCR slaving circuit wherein first and second controlled rectifiers are connected in parallel with each other and are further connected in series with a load across an AC line. A control signal is coupled to the gate electrode of the first controlled rectifier to control the slaving action in the circuit, and rectifier control circuitry is coupled between one side of the AC line and the gate electrode of the second controlled rectifier. The rectifier control circuitry blocks gate current to the second controlled rectifier on one-half cycle of the AC line voltage and thereafter provides gate current to turn on the second controlled rectifier. The second controlled rectifier will turn on the following half-cycle of the AC line voltage provided that the first controlled rectifier was conducting the previous half-cycle of the AC line voltage.

3,581,115
PULSE GENERATOR FOR PROVIDING A PLURALITY OF PULSES IN DETERMINED PHASE POSITIONS
Rolf Weber, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany
Filed June 20, 1969, Ser. No. 834,946
Claims priority, application Germany, June 22, 1968, 1,762,470
Int. Cl. H03k *1/12*
U.S. Cl. 307—262 **7 Claims**



A switch is switched to its conductive condition by the output of a bistable multivibrator and transfers pulses produced by a pulse generator to a counter. The counter counts the pulses and supplies an output signal indicating the end of a counting cycle to an AND gate connected in the reset input of the multivibrator. When an auxiliary signal is supplied to the AND gate, the output signal of the counter resets the multivibrator and the switch is switched to its nonconductive condition and prevents the supply of pulses from the pulse generator to the counter.

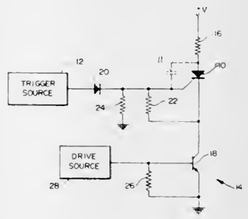
3,581,116
DIGITAL CONTROLLED STEP VOLTAGE GENERATOR
Joseph Leostic, Le Mesnil Saint-Denis, France, assignor to C.I.T. Compagnie Industrielle Des Telecommunications, Paris, France
Filed Sept. 4, 1968, Ser. No. 757,441
Claims priority, application France, Sept. 4, 1967, 119905
Int. Cl. H03k *25/00*
U.S. Cl. 307—264 **11 Claims**



Digital-controlled generator supplying, during a major cycle, a continuous voltage which is proportional to the fraction i/N of a fixed voltage, with i variable in units from O to

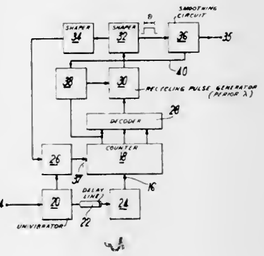
N, said major cycle having a duration of K minor cycles, of which each lasts N times an elementary duration t_0.

3,581,117
THYRISTOR CIRCUIT HAVING IMPROVED TURNOFF CHARACTERISTICS
Lloyd H. Dixon, Jr., Boxford, Mass., assignor to Unitrode Corporation, Watertown, Mass.
Filed July 9, 1968, Ser. No. 743,386
Int. Cl. H03k *17/00*
U.S. Cl. 307—252 **7 Claims**



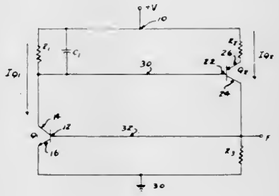
A thyristor circuit in which self-triggering which may be caused by spurious gate drive is prevented. A thyristor is switched off by interrupting the flow of cathode current while providing a gate circuit path for charging the anode-gate junction capacitor. Upon reapplication of cathode current, self-triggering cannot occur by reason of the fully charged condition of the junction capacitor.

3,581,118
METHOD OF PULSE SHAPING AND RENEWABLE DURATION VARIABLE PULSE-SHAPING CIRCUIT FOR THE APPLICATION OF SAID METHOD
Robert Van Zurk, Meylan, France, assignor to Commissariat A L'Energie Atomique, Paris, France
Filed June 17, 1968, Ser. No. 737,765
Claims priority, application France, June 21, 1967, 111,389
Int. Cl. H03k *1/18*
U.S. Cl. 307—267 **10 Claims**



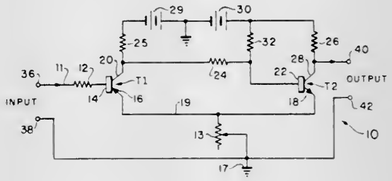
A method of pulse shaping and an electronic assembly for carrying out said method whereby incident pulses are transmitted to a counter in order to reset said counter to zero, and whereby the resultant signal is recycled, the operation is continued as long as the counter has not recorded a predetermined number and the successive pulses produced by the generator are converted to a single wide pulse. The assembly comprises a counter which has a plurality (n) of flip-flops, an element for resetting the counter to zero and coupled to the input of the assembly, a logic circuit whose inputs are coupled to each flip-flop of the counter, a pulse generator controlled by the logic circuit as well as a zero-overlap variable shaping device which follows said pulse generator and is coupled to the input of the counter as well as to the output of the assembly.

3,581,119
PHOTO-CURRENT DIVERTER
Gary Grundy, Rosemount, Minn., assignor to The United States of America as represented by the Secretary of the Air Force
Filed Apr. 8, 1969, Ser. No. 814,335
Int. Cl. H03k *17/16*
U.S. Cl. 307—288 **3 Claims**



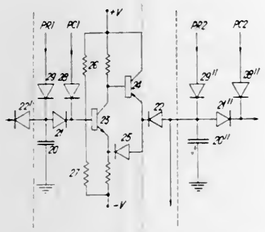
A transistorized clamping circuit is useful to quickly and efficiently divert radiation induced photocurrents to prevent damage to semiconductor systems. Through the use of a low power, fast turn-on transistor and a high power, slow turn-on transistor, the circuit is able to divert both the initial photocurrent surge and the continuing high photocurrent generated by the radiation.

3,581,120
SCHMITT TRIGGER CIRCUIT WITH VARIABLE HYSTERESIS AND INSENSITIVITY TO TEMPERATURE CHANGE
Hans H. Nord, Little Falls, N.J., assignor to The Western Union Telegraph Company, New York, N.Y.
Filed Feb. 28, 1968, Ser. No. 709,033
Int. Cl. H03k *3/15, 3/295*
U.S. Cl. 307—290 **3 Claims**



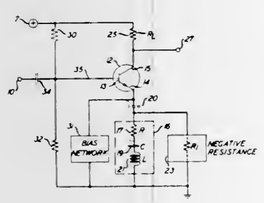
A Schmitt trigger circuit is disclosed which employs a complementary pair of transistors in a direct coupled configuration with regenerative feedback. The circuit provides means for controlling hysteresis and is substantially insensitive to temperature changes of its transistors. The circuit employs a single variable resistor in a common emitter circuit to provide symmetrical change in hysteresis.

3,581,121
DELAY LINE ARRANGEMENT
John Thomas Lawrence Sharpe, Harlow, Essex, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Mar. 26, 1969, Ser. No. 810,631
Claims priority, application Great Britain, Apr. 16, 1968, 17808/68
Int. Cl. H03k *17/28*
U.S. Cl. 307—293 **3 Claims**



An automatic equalization circuit, e.g. for telephone channels carrying high-speed data, of the kind using a lumped-constant delay line for temporary storage of channel signals, is simplified by substituting for the delay line a chain of capacitive storage elements linked by diode or FET gates.

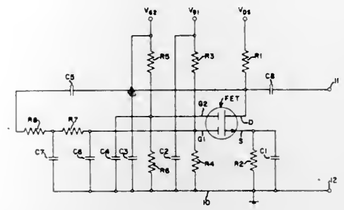
3,581,122
ALL-PASS FILTER CIRCUIT HAVING NEGATIVE RESISTANCE SHUNTING RESONANT CIRCUIT
Wilmer B. Gaunt, Jr., Boxford, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.
Filed Oct. 26, 1967, Ser. No. 678,417
Int. Cl. H04b *3/14*
U.S. Cl. 307—295 **7 Claims**



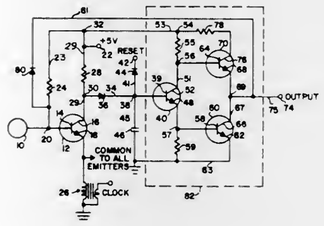
A transistor circuit having a constant amplitude vs frequency response is described. The required transfer function is obtained by connecting a negative resistance across a resonant network in the transistor circuit. This arrangement provides a pole-zero pattern in the complex plane representation which is symmetrical with respect to the imaginary axis whereby the absolute magnitude of the ratio of output signal to input signal is constant for all frequencies.

3,581,123
CIRCUIT FOR PROVIDING INDUCTIVE IMPEDANCE
Jurgen Pest, Lynchburg, Va., assignor to General Electric Company
Filed Mar. 27, 1969, Ser. No. 811,031
Int. Cl. H01p *1/24*
U.S. Cl. 307—304 **1 Claim**

A field-effect transistor, having a source electrode, a drain electrode, a first insulated gate electrode, and a second insulated gate electrode, is provided with a feedback circuit comprising one or more series resistors and one or more shunt capacitors connected between the drain electrode and the first insulated gate electrode. This circuit provides an inductive impedance between the source and drain electrodes without inductive coils.



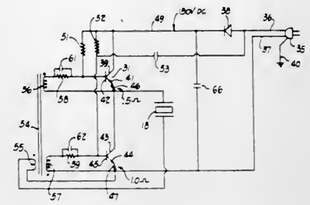
3,581,124
SOLID-STATE TOUCH-RESPONSIVE SWITCH CIRCUIT
Richard A. Flores, 425 S. Reese Place, Burbank, Calif., and Michael Sherman, 17042 Lorillard St., Granada Hills, Calif.
Filed Jan. 17, 1969, Ser. No. 797,719
Int. Cl. H03k *4/48*
U.S. Cl. 307—308 **8 Claims**



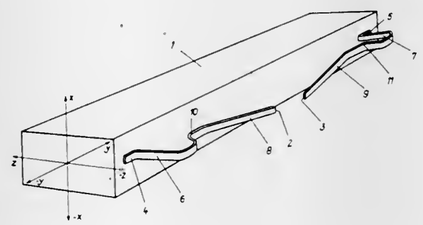
A solid-state touch-responsive switch circuit using principally NPN transistors. The base of the first transistor is connected direct to a grounding key adapted preferably to be touched by a finger. The emitter of the transistor is connected to ground through a clock-pulse generator. The collector of this transistor is connected to a power supply through a suitable resistor and to the base of a second transistor through a rectifying diode. This second transistor together with transistors three and four comprise a clamping and amplifying circuit for the output. A feedback line from the outputs of the amplifying transistors back to the base of the first transistor through a diode clamps the output "on" only after the finger has switched the base of the first transistor to "on" and holds it on when the finger has been removed from the key.

3,581,125
OSCILLATOR CIRCUIT FOR ULTRASONIC APPARATUS
John P. Arndt, Cleveland, and Edmond G. Franklin, North Canton, Ohio, assignors to Clevite Corporation
Division of Ser. No. 660,262, Aug. 14, 1967, Pat. No. 3,516,645
Filed Sept. 30, 1969, Ser. No. 862,342
Int. Cl. H01v *7/00*
U.S. Cl. 310—8.1 **9 Claims**

An oscillator circuit is provided for ultrasonic apparatus such as ultrasonic cleaners employing a resonant transducer. The circuit includes a pair of transistors connected in series to a source of power with the transducer connected across one of the transistors in series with the primary winding of a transformer which has secondary windings connected in opposite polarity to the bases of the transistors so that one transistor is saturated while the other is nonconducting. The circuit accordingly oscillates at substantially the resonant frequency of the transducer as a result of the feedback provided by the secondary windings of the transformer.



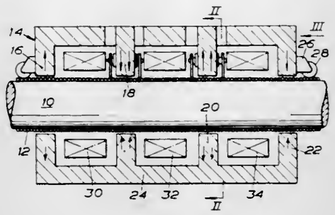
3,581,126
MOUNTING DEVICE FOR FLEXION VIBRATORS
Luc Omlin, Neuchatel, Switzerland, assignor to Centre Electronique Horloger S. A., Neuchatel, Switzerland
Filed Dec. 29, 1969, Ser. No. 888,513
Claims priority, application Switzerland, Jan. 13, 1969, 402/69
Int. Cl. H01v *7/00*
U.S. Cl. 310—9.1 **10 Claims**



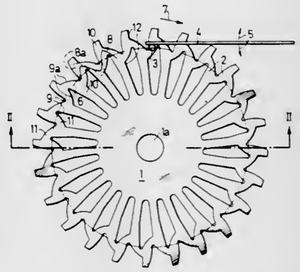
A mounting device for flexion vibrators with two vibration node axes, in particular X-Y flexion quartzes in time-measuring apparatus, which have a hold on the surfaces of the flexion vibrator in the neighborhood of nodes in the points of emergence of the vibration node axes, comprising strips of approximately rectangular cross section in connection members between flexion vibrator and securing points on a support. One end of each strip respectively is directly secured to the flexion vibrator whilst the other end is connected to the support; the long sides of the sections of the strips run practically parallel to the main direction of vibration, and the strips are bent practically perpendicularly to the main direction of vibration and at least partly in a direction perpendicular to the vibration node axes.

3,581,127
LINEAR ELECTRIC MOTOR
Kenneth Warnett, Wyke, Bradford, England, assignor to Electro-Lifts Limited, Leeds, England
Filed Apr. 21, 1969, Ser. No. 817,670
Claims priority, application Great Britain, Apr. 20, 1968, 18777/68
Int. Cl. H02k *41/02*
U.S. Cl. 310—13 **3 Claims**

A linear motor has an armature with an electrical winding and a stator with a plurality of axially spaced pole pieces. These pole pieces are of annular formation surrounding the armature, and are joined together by a cylindrical outer casing which provides the flux path. There are field windings fitted between adjacent pole pieces, and pairs of brushes mounted on the faces of the intermediate pole pieces and urged into contact with the armature winding.

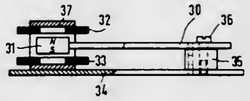


3,581,128
STEPPING WHEEL
Alfred Meisner, and Walter Spitzl, Nurnberg, Germany, assignors to Diehl, Nurnberg, Germany
Filed Oct. 3, 1969, Ser. No. 863,525
Claims priority, application Germany, Oct. 9, 1968, P 18 01 972.2
Int. Cl. H02k *7/02*
U.S. Cl. 310—21 **12 Claims**



A drive for a clockworks in which a magnet is caused to oscillate adjacent a wheel in the radial direction of the wheel. An undulating magnetic path is formed on the wheel in the range of oscillation of the magnet and the configuration of the magnetic path is such that oscillation of the magnet will develop a torque on the wheel to drive it in one direction only.

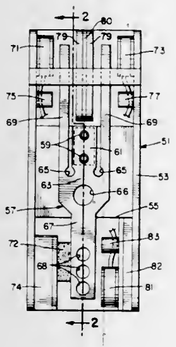
3,581,129
TUNING FORK DEVICES
Wolfgang Ganter, Schramberg/Sulgen, and Friedrich Assmus, Schramberg/Wurttenberg, Germany, assignors to Messrs. Gebruder Junghons Gesellschaft mit Beschrankter Haftung, Schramberg Wurttenberg, Germany
Division of Ser. No. 816,264, Apr. 15, 1969, Pat. No. 3,529,414 which is a division of application Ser. No. 555,766, now Patent No. 3,456,137. Filed June 5, 1970, Ser. No. 43,702
Int. Cl. H02k *33/00*
U.S. Cl. 310—25 **2 Claims**



A tuning fork for timekeeping devices having two parallel tines with a permanent magnet mounted on each free end thereof and means to mount the tines on a baseplate and a

housinglike magnet-return bracket fixed to the baseplate and surrounding the permanent magnets and bearing the coil assembly.

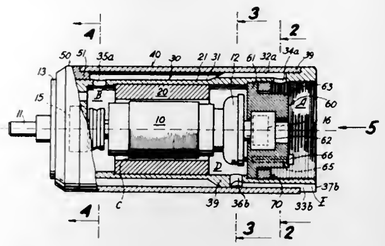
3,581,130
COUNTERBALANCED RESILIENTLY SUPPORTED TUNING FORK
Boris F. Grib, Huntington, N.Y., assignor to Philamon Incorporated, Westbury, N.Y.
Continuation-in-part of application Ser. No. 743,445, July 9, 1968, now Patent No. 3,480,809. This application Nov. 24, 1969, Ser. No. 879,361
Int. Cl. H02k *33/00*
U.S. Cl. 310—25 **9 Claims**



There is disclosed a tuning fork resonator with electrical drive and pickup coils and a tuning fork having a pair of tines, a common tine-junction section, a supporting portion for securing the fork in place and a pliant section between the common tine-junction portion and the supporting portion of the fork. The fork is provided with a counterbalance which is oppositely disposed from the tines of the fork with respect to the pliant section. The counterbalance counteracts the tendency of the tine ends to rotate in response to lateral acceleration force due to compliance of the pliant section and in some cases also counteracts the response to lateral acceleration force due to bending of the tines themselves. A version is disclosed in which there are two forks laterally spaced with the tine ends physically bridged together by shutters to form an elongated undulating aperture and with the counterbalance and common tine-junction portions of the two forks consisting of a common bridging structure which is relatively rigid so that the two pairs of tines of the respective fork sections are substantially in unison both as to tine vibrations and as to reaction to acceleration forces.

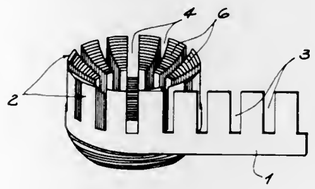
3,581,131
SMALL ELECTRIC MOTORS FOR DENTAL EQUIPMENT OR THE LIKE
Cestmir Richter, Nachod, Czechoslovakia, assignor to Mez Nachod, Narodni podnik, Nachod, Czechoslovakia
Filed Dec. 2, 1969, Ser. No. 881,491
Claims priority, application Czechoslovakia, Dec. 11, 1968, PV8425/61
Int. Cl. H02k *9/10*
U.S. Cl. 310—58 **8 Claims**

A relatively small electric motor adapted to be used for operating dental equipment or the like. The motor includes a rotor and a stator, situated in a motor housing which is formed at its exterior with an inlet passage extending forwardly for directing cooling air to the front of the rotor and stator to flow rearwardly through the gap therebetween. The housing is also formed with an outlet passage having a front end communicating only with the rear of this gap and with the outer atmosphere. In this way cooling air can enter from the rear of the housing into the inlet passage to flow therealong to the front where the cooling air reverses its direction of flow so as to travel rearwardly through the gap



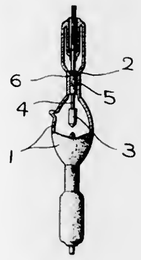
between the rotor and stator to be received in the outlet passage so as to discharge back to the outer atmosphere.

3,581,132
ROTATING ELECTRICAL MACHINE
Nikolaus Laing, 35—37 Hofener Weg. 7141, Aldingen, Germany
Filed Apr. 3, 1969, Ser. No. 813,096
Int. Cl. H02k *17/00*
U.S. Cl. 310—166 **17 Claims**



In a rotating electrical machine having a pole ring having poles which extend towards the airgap between the stator and the rotor and which are formed with winding slots extending parallel to the rotor axis, the winding extending radially through the winding slots, the pole surfaces near the airgap are larger than the smallest cross sections of the poles. The armatures of such rotating machines can in known manner be formed by spirally coiled strip. A rotating electrical machine of this kind makes a very good pump motor of the kind wherein a partition provides a sealingtight separation between the driven element and the driving element.

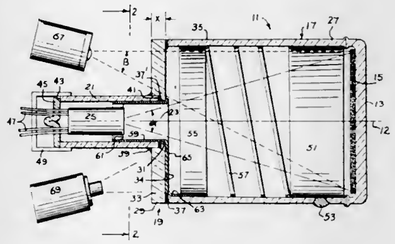
3,581,133
GASEOUS DISCHARGE TUBE WITH METALLICALLY COATED, ELECTRODE SUPPORT PORTIONS
Jiro Ushio, Tokyo, Japan, assignor to Ushio Electric Inc., Tokyo, Japan
Filed Dec. 23, 1968, Ser. No. 786,216
Int. Cl. H01j *17/04*
U.S. Cl. 313—43 **2 Claims**



A discharge tube characterized in that a coat of an element selected from the group consisting of rhenium, niobium and

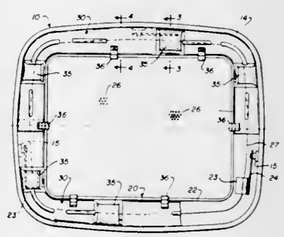
rhodium is applied to a supported portion of an electrode or an electrode supporting member of an electrode which is supported by an electrode supporting portion of a quartz or glass envelope of the discharge tube.

3,581,134
CATHODE RAY TUBE HAVING AN ANNULAR-SHAPED REAR WINDOW
Alfred D. Johnson, Seneca Falls, N.Y., assignor to Sylvania Electric Products Inc.
Filed Dec. 20, 1968, Ser. No. 785,646
Int. Cl. H01j *29/86*
U.S. Cl. 313—64 **1 Claim**



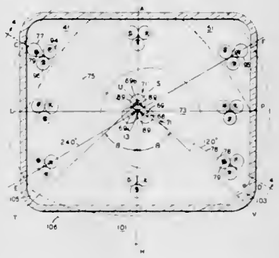
A rear-window cathode ray tube having a longitudinal axis and an envelope of substantially glass construction wherein there is oriented a cathodoluminescent screen and at least one related electron gun. The envelope has a substantially annular-shaped optical access window therein oriented in substantially symmetrical relationship to the longitudinal axis of the tube to provide a substantially annular viewing area for observing the electron impinged side of the screen.

3,581,135
COLOR TUBE ELECTRON SHIELD HAVING OUTWARDLY BOWED EDGES DIRECTED TOWARD VIEWING SCREEN TO MINIMIZE SEAL EDGE INTERFERENCE
Elgie E. Garrett, Chicago; Thomas P. De Franco, Norridge, and Nicholas B. Staples, Chicago, Ill., assignors to Admiral Corporation, Chicago, Ill.
Filed Nov. 18, 1968, Ser. No. 776,338
Int. Cl. H01j *1/53, 29/40*
U.S. Cl. 313—85 **9 Claims**



An electron barrier consisting of two identical shields of semirigid formed aluminum foil having forwardly bowed edges resiliently contacting the inner wall of a color picture tube panel well below frit seal line. The shadow-mask frame includes a lip cooperating with raised portions on the shields to insure flexure of the bowed edges during installation.

3,581,136
COLOR DOT SCREEN WITH DOT FORM COMPENSATION FOR APPARENT SHIFT OF BEAM DEFLECTION CENTER
Kenneth L. Staunton, Columbus Grove, Ohio, assignor to Sylvania Electric Products, Inc.
Division of Ser. No. 665,563, Sept. 5, 1967, Pat. No. 3,499,372. Filed July 9, 1969, Ser. No. 871,037
Int. Cl. H01j *29/32, 29/30*
U.S. Cl. 313—92B **4 Claims**

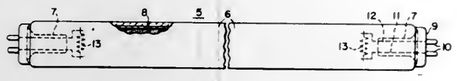


An optical system utilized for providing a tridot patterned color cathode ray tube screen wherein the dot patterns are modified in discrete screen areas to improve the registration of the electron beams with their respective phosphor dots thereby improving color purity of the display. The light source in the optical system used in effecting screen exposure has contiguously oriented light control means with portions formed to provide both symmetrical and unsymmetrical exposure illumination. Thus, by utilizing unsymmetrical exposure, patterns of elongated dots are disposed on different discrete portions of the screen for each of the respective phosphors to achieve improved beam dot registration.

3,581,137
ELECTRIC LAMP HAVING AN ENVELOPE COMPOSED OF PHOTORESISTANT SODA-LIME SILICATE GLASS
Edward G. F. Arnott, Wilkinsburg, and Daniel W. Lewis, Pittsburgh, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Continuation-in-part of application Ser. No. 741,370, July 1, 1968, which is a continuation-in-part of application Ser. No. 657,123, July 31, 1967. This application July 15, 1968, Ser. No. 744,832
Int. Cl. H01j *1/63, 61/30, 61/35*
U.S. Cl. 313—109 **16 Claims**

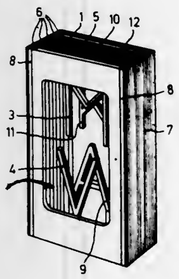
The light output and lumen maintenance of an electric lamp that generates both visible and ultraviolet radiations (e.g., a fluorescent, an incandescent, or a high-pressure mercury vapor discharge lamp) is enhanced by utilizing an envelope that is composed of a modified soda-lime silicate glass which has a low initial coefficient of absorption in the visible region (below about 0.05 cm.$^{-1}$), and inhibits the discoloration or "solarization" effect of impinging ultraviolet-radiation. The absorption coefficient in the visible region is maintained below approximately 0.4 cm.$^{-1}$ after prolonged exposure of the envelope to ultraviolet radiation by controlling the Fe_2O_3 content and adding selected amounts of TiO_2 or MoO_3, or mixtures thereof, to the glass during manufacture. The preferred ranges are between 0.8 percent and about 3

percent by weight TiO_2 and from about 0.5 percent to 1 percent by weight MoO_3 when these materials are added as



separate components. The Fe_2O_3 content does not exceed about 0.07 percent by weight.

3,581,138
GAS DISCHARGE TUBE WITH COLD CATHODE SUITABLE FOR THE SIMULTANEOUS REPRODUCTION OF TWO LEGIBLE CHARACTERS
Adrianus Anthonius Maria Hendriks, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 8, 1969, Ser. No. 789,773
Claims priority, application Netherlands, Jan. 12, 1968, 6,800,473
Int. Cl. H01j *61/66*
U.S. Cl. 313—109.5 **2 Claims**

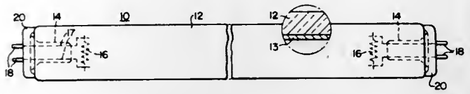


A gas discharge tube for reproducing two independently switchable legible characters which adjoin each other and constitute two groups, the characters being secured to annular frames of equal dimensions but having dimensions which are smaller than the frame and the groups being surrounded by a partially perforated anode. The two groups of characters are associated with a single electrode set. Since the characters are smaller than the associated frame, two characters associated with different groups can be reproduced.

3,581,139
FLUORESCENT LAMP HAVING TITANIUM DIOXIDE-CONTAINING GLASS ENVELOPE AND REDUCED PHOSPHOR WEIGHT
Harry H. Haft, Whippany, and Robert W. Repsher, Kenelon, N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Mar. 20, 1969, Ser. No. 808,801
Int. Cl. H01j *61/30, 61/42*
U.S. Cl. 313—109 **6 Claims**

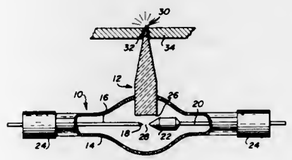
TiO_2 is included as a constituent in the soda-lime silicate glass envelope of a fluorescent lamp in an amount sufficient to chemically stabilize the glass an thus permit the use of a thinner phosphor coating without decreasing the light output of the lamp or impairing its lumen maintenance. Up to 10 percent by weight TiO_2 is employed and less than 2 percent by weight is preferred to minimize lamp cost. The TiO_2 also inhibits solarization and the resultant darkening of the envelope under the influence of the impinging ultraviolet radiations generated within the lamp during operation.

With 1.25 percent by weight TiO_2 in the glass, the amount of phosphor required per lamp is reduced by 30 percent without decreasing the light output or lumen maintenance. In the case of calcium halophosphate type phosphor, the



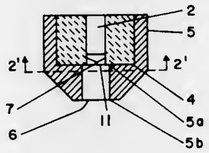
phosphor weight per lamp is reduced by 40 percent without impairing the lumen maintenance and with only a slight drop in light output compared to a conventional lamp utilizing the same type of phosphor.

3,581,140
HIGH INTENSITY LIGHT SOURCE WITH INTEGRAL RADIANT-ENERGY-COUPLING APPARATUS
Raymond E. Paquette, Saratoga, Calif., assignor to Varo, Inc., Garland, Tex.
Filed June 11, 1968, Ser. No. 736,082
Int. Cl. H01j *5/16*
U.S. Cl. 313—110 **6 Claims**



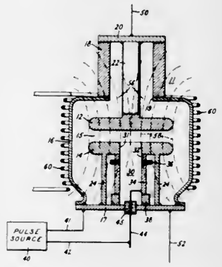
An optically efficient light-transmitting rod is formed integral with the envelope of a high intensity illumination producing means such that one end of the rod is positioned proximate the luminant source, and the other is shaped into a suitable utilization form or is adapted so as to provide a means with which to couple the radiant energy to a utilization means.

3,581,141
SURFACE GAP SPARK PLUG
Richard C. Beaubier, Royal Oak, Mich., assignor to Ethyl Corporation, New York, N.Y.
Continuation-in-part of application Ser. No. 776,441, Nov. 18, 1968, now abandoned. This application Apr. 7, 1969, Ser. No. 813,947
Int. Cl. H01t *13/32, 13/52*
U.S. Cl. 313—130 **17 Claims**



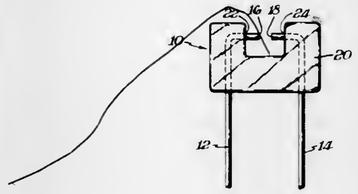
A surface gap spark plug having improved resistance to fouling is described. A method of operating an internal combustion engine and other devices, which utilize a fuel containing an organometallic additive is also disclosed.

3,581,142
TRIGGERED VACUUM GAP DEVICE WITH MEANS FOR REDUCING THE DELAY TIME TO ARC-OVER THE MAIN GAP
Raymond L. Boxman, Cambridge, Mass., assignor to General Electric Company
Continuation-in-part of Ser. No. 792,709, Jan. 21, 1969.
Filed Mar. 19, 1969, Ser. No. 808,617
Int. Cl. H01j *1/50*
U.S. Cl. 313—162 **6 Claims**



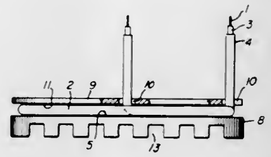
Discloses a triggered vacuum gap device that comprises a pair of spaced-apart main electrodes defining a main gap therebetween and triggering means adjacent one of the main electrodes but relatively remote from the other for causing arc-over of said main gap upon activation of said triggering means. For reducing the time delay between activation of the triggering means and arc-over of the main gap when the relatively remote electrode is negative, means is provided for developing a magnetic field generally parallel to the electric field between the electrodes in the region of the triggering means.

3,581,143
NONTRACKING WIRE SPARK GAP COMPONENT
John E. Dornfeld, Mequon, Wis., assignor to Sprague Electric Company, North Adams, Mass.
Filed Jan. 16, 1969, Ser. No. 791,683
Int. Cl. H01j *17/00, 21/00*
U.S. Cl. 313—325 **4 Claims**



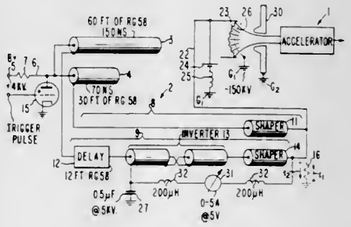
Each of two noncontacting wire leads has a face of one extremity in registration a predetermined fixed distance from its counterpart to form a spark gap therebetween. Each lead is bent so that the extensions of the leads are oppositely disposed and spaced from each other by a distance substantially greater than the spark gap. A mass of nonconducting material covers both of the bends, and bridges the lead extensions near the bends so as to fix the spacing of the spark gap. The mass is also set back on both sides of the spark gap a distance at least sufficient to assure avoidance of exposure of the mass to carbonizing temperatures during sparking within the voltage rating range of the unit.

3,581,144
METAL-CLAD INSULATED ELECTRICAL HEATER
James E. Beggs, Schenectady, N.Y., assignor to General Electric Company
Filed Mar. 27, 1969, Ser. No. 811,067
Int. Cl. H01j *1/24*
U.S. Cl. 313—340 **8 Claims**



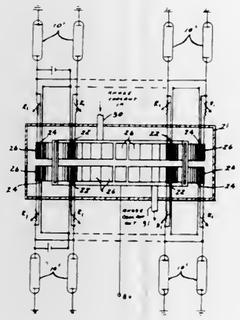
A low mass insulated heater that can be bonded with low thermal drop to an object to be heated consists of a planar arrangement of a heater wire which, after being covered with a thin coating of insulation, is coated with material that is sintered or alloyed to form a metallic sheath. The sheath is brazed directly to a member to be heated to form an integrally bonded structure in which the composite materials all have similar thermal expansion characteristics.

3,581,145
PULSE-FORMING NETWORK FOR A SHORT PULSE LINEAR ACCELERATOR
Dennis E. Morris, Sunnyvale, Calif., assignor to Varian Associates, Palo Alto, Calif.
Continuation-in-part of Ser. No. 792,709, Jan. 21, 1969.
Filed Mar. 3, 1969, Ser. No. 803,921
Int. Cl. H01j *25/36*
U.S. Cl. 315—30 **4 Claims**



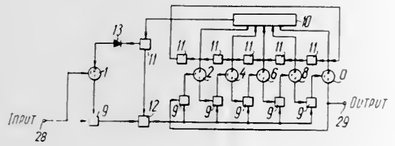
A pulse-forming network is disclosed as employed for pulsing the beam of a microwave linear accelerator to provide a train of beam pulses, such pulses being on the order of 2 nanoseconds long. The pulse-forming network includes a pair of open-circuited coaxial cables connected in parallel between a source of potential and an adder. The adder supplies a pulse output to the cathode of the electron gun of the accelerator. One of the parallel branches of the pulse-forming network includes a series connection of one of the coaxial cables, and a delay, and a pulse inverter. The inverted and noninverted pulses obtained by simultaneously shorting the charged coaxial lines to ground are added in the adder to produce a resultant negative pulse applied to the cathode of the gun for turning the gun on for the short 2 nanoseconds. Ferrite-loaded coaxial pulse shapers are disposed in each of the parallel branches for sharpening the leading edge of the resultant negative pulse. One of the distributed coaxial lines is substantially longer than the other to make the positive inverted pulse longer than the negative noninverted pulse, such that the gun is held in the OFF condition for a period following each of the pulses to prevent unwanted dark current. A coupling capacitor is connected between the pulse inverter and ground for holding off a positive quiescent DC bias potential applied to the cathode of the gun. A variable DC current is fed through one of the pulse shapers for varying the pulse width of the resultant pulse.

3,581,146
BALLAST FOR A PLURALITY OF PARALLEL GASEOUS DISCHARGES
Alan E. Hill, 5444 A, Rte. 5, Albuquerque, N. Mex.
Filed July 29, 1969, Ser. No. 845,808
Int. Cl. G05f *1/06*
U.S. Cl. 315—180 6 Claims



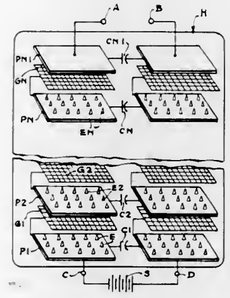
A plurality of gaseous discharge tubes connected to a common power supply has a vacuum tube connected in series with each gaseous discharge tube to provide ballast for the individual gaseous discharge tubes, a water-cooled, heavy duty anode is provided with a plurality of cathodes positioned adjacent the anode. A discharge tube is connected in each of the cathode circuits. Negative feedback is used to limit the current through each discharge tube. Variable feedback resistors permit balancing of the discharge paths.

3,581,147
ELECTRONIC PULSE COUNTER WITH BISTABLE SWITCHING ELEMENTS
Lev Nickolaevich Korablev, Moscow, U.S.S.R., assignor to Fizichesky Institute IM.P.N., Lebedera, Moscow, U.S.S.R.
Filed Aug. 14, 1967, Ser. No. 660,326
Int. Cl. H01j *17/36;* H03k *21/32, 23/18, 23/28*
U.S. Cl. 315—84.5 13 Claims



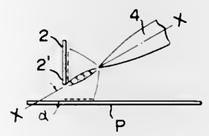
Several different embodiments of the invention in the form of different pulse counters are disclosed involving the use of switching elements and particularly cold-cathode tubes in association with coincidence circuits to provide a pulse counter, there being particularly employed a one-way feedback circuit which has a reduced number of switching elements, smaller than the conversion factor and capacitance of the counter, the input of the first element or stage being directly connected to the counter input, and the combined outputs of at least two last elements or stages of the counter being connected by a unidirectional feedback circuit for returning the preceding elements or stages to the initial zero condition.

3,581,148
DIRECT CURRENT STATIC TRANSFORMER
Roger Raoul Brignet, 98, Rve Saint Spire, Corbeil-Essones, France
Continuation-in-part of application Ser. No. 637,470, May 10, 1967. This application June 4, 1969, Ser. No. 830,312
Int. Cl. H05b *37/00, 39/00, 41/14*
U.S. Cl. 315—227 4 Claims



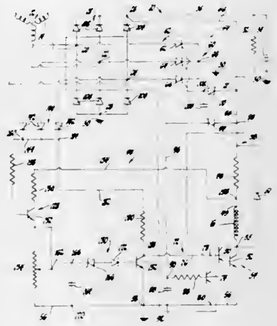
A direct current static transformer for continuous operation comprising a series of successive stages each including a first conductive plate having a multiplicity of thin, needlelike individual electrodes directed toward a second conductive plate, the second conductive plate having a relatively smooth surface facing toward the needle electrodes. Each stage further includes an electrically conductive grid interposed between the first and second plates, the grid being electrically connected to the first plate. The second plate for one stage constitutes the first plate for the next succeeding stage in the transformer. In a preferred construction, there are two such series of successive stages, one series connected to the positive terminal of a DC supply and the other series connected to the negative terminal, with a capacitor connected between the corresponding plates of the two series in each stage.

3,581,149
CORONA DISCHARGING DEVICE FOR ELECTROPHOTOGRAPHIC PROCESS
Hiroshi Tanaka, and Masayoshi Ishihara, both of Tokyo, Japan, assignors to Canon Camera Kabashiki Kaisha, Tokyo, Japan
Filed July 11, 1968, Ser. No. 744,117
Claims priority, application Japan, July 14, 1967, 45-468/67
Int. Cl. H05h *1/00*
U.S. Cl. 317—4 8 Claims



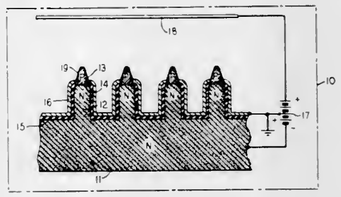
Apparatus for use in imparting charge to a member including a conductive element having an end juxtaposed with the surface of the member being charged and a needle-form corona discharge electrode providing a discharge directed principally onto the conductive element. The corona discharge electrode is disposed in a plane substantially nonperpendicular to the member being charged and intersecting the plane containing the conductive element.

3,581,150
OVERVOLTAGE PROTECTION CIRCUIT FOR A GENERATOR REGULATOR SYSTEM
Thomas E. Kirk, and Gerald H. Stenklyft, both of Anderson, Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed Apr. 8, 1970, Ser. No. 26,707
Int. Cl. H02h *3/22;* H02j *7/14*
U.S. Cl. 317—16 2 Claims



An overvoltage protection circuit for a vehicle electrical generating system provides a plurality of controlled rectifiers connected to the generator output winding for shunting high transient voltages to ground. A control transistor having a time delay biasing circuit is connected to the field winding excitation circuit for holding the field winding deenergized during the high voltage condition. A single overvoltage detecting device is used to render both the plurality of controlled rectifiers and the control transistor conductive.

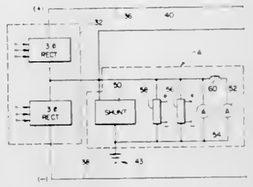
3,581,151
COLD CATHODE STRUCTURE COMPRISING SEMICONDUCTOR WHISKER ELEMENTS
Willard S. Boyle, Summit, and Jack A. Morton, South Branch, both of, N.J., assignors to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.
Filed Sept. 16, 1968, Ser. No. 762,296
Int. Cl. H01l *3/00, 5/00*
U.S. Cl. 317—234 9 Claims



Cold cathode structures comprise a plurality of semiconductor whisker elements each including an electronic barrier near the free end. Electron emission is enhanced by a high external field that is concentrated at the tip of each whisker element.

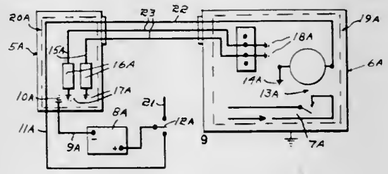
3,581,152
GROUND PROTECTION AND DETECTING FOR HIGH VOLTAGE DC TRANSMISSION SYSTEM
Lloyd F. Hunt, 221 Rocky Point Road, Palos Verdes Estates, Calif.
Filed Mar. 16, 1970, Ser. No. 19,750
Int. Cl. H02h *3/16*
U.S. Cl. 317—18D 10 Claims

A grounding system for high voltage DC transmission lines which provides protection for and detection of changes in the normal operating mode of the high voltage system. The transmission system has a single connection to the earth, at a first point, all other points remote from the first being insulated from their local earth points. Common ground points are provided for all the equipment of the transmission system in



each particular area, and these common ground points are then referenced by way of a return line to the single earth connection. Current sensitive means are provided at the single earth connection and voltage sensitive means are provided at the remote locations to detect fault conditions and, where necessary, to shut down the system.

3,581,153
CONTROL CIRCUITRY TO PREVENT USE OF A SECONDARY CIRCUIT WITHOUT STATIC ELECTRICITY GROUNDS
John Joyce, 179 Thacher St., Milton, Mass.
Filed Apr. 8, 1969, Ser. No. 814,344
Int. Cl. H02h *1/02*
U.S. Cl. 317—18 7 Claims

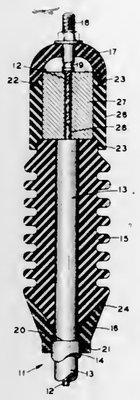


Control circuits are disclosed to prevent the use of a secondary circuit, each control circuit including first and second grids with the control circuit including a relay in control of the secondary circuit and having a grounded connection with the second grid and parallel leads each including a resistor and having a grounded connection with both grids, the resistors being operative to prevent the closing of the secondary circuit unless all the grounds of the parallel leads are effective.

3,581,154
SURGE-DEFLECTING CABLE TERMINATOR
J. Hebden Willox, 917 Newcastle Ave., Westchester, Ill.
Filed Nov. 18, 1968, Ser. No. 877,716
Int. Cl. H02h *9/06*
U.S. Cl. 317—61.5 20 Claims

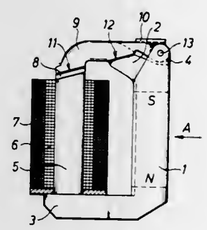
A weathertight surge-responsive electrical cable terminator, adapted for use in connecting an underground insulated cable to an exposed overhead conductor, includes a housing of insulating material in which the cable end is hermetically sealed alongside a member of magnetic material. Lightning surges transmitted by the exposed overhead conductor to the point of connection are deflected by the electromagnetic

cooperation of the magnetic member with the surge current upon its appearance in the terminator. The terminator is ef-



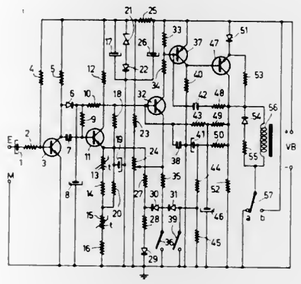
fective either as a reflector to turn the surge back to the overhead conductor, or as a diverter to direct the surge to an associated lightning arrester.

3,581,155
ELECTROMAGNETIC MAKE-AND-BREAK IGNITION DEVICE FOR A POCKET LIGHTER
Richard Halm, 7061 Battmannsweiler Kreis, Schorndorfer Strasse 8, Esslingen Am Nekar, Germany
Filed Mar. 18, 1969, Ser. No. 808,261
Claims priority, application Austria, Mar. 21, 1968, 2,839
Int. Cl. F23g *3/01*
U.S. Cl. 317—81 **7 Claims**



A make-and-break magneto especially for a pocket lighter having a substantially rectangular shape and comprising a permanent magnet forming at least a part of one side of the rectangle, magnetic conductors secured to and carrying the magnet, at least a part of one of the conductors forming a core which forms the opposite side of the rectangle and carries coil windings, and an armature pivotably connected by a bearing to the end of the magnet-carrying side; the upper end of the magnet itself or of one of the magnetic conductors forming an extension of the magnet being bent obliquely upwardly in the direction toward the axis of the core, and the upper ends of the core and of the extensions forming contact surfaces which are obliquely inclined to the axis of the core and extend within a common plane, and the armature having corresponding contact surfaces which are likewise inclined to said axis and extend within a common plane. The armature is pivotably mounted in such a position that, when the magnetic circuit is closed by said armature, the two planes of the associated contact surfaces coincide with each other and these contact surfaces engage fully with each other.

3,581,156
ELECTRONIC ARRANGEMENT FOR CONTROLLING AN ELECTROMAGNETIC CLUTCH
Raymond Dolbachlan, Meudon, and Claude Lefevre, Saint Maur, both of, France, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 6, 1969, Ser. No. 797,115
Claims priority, application France, Feb. 16, 1968, 140113
Int. Cl. F16d *67/00;* **H01h** *47/32*
U.S. Cl. 317—123 **10 Claims**

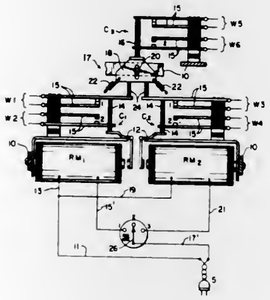


An automatic clutch control system for use in a motor vehicle includes an engine speed transducer that supplies a speed voltage to a control circuit. A power circuit controlled by the control circuit supplies current to the operating coil of the automatic clutch. The control circuit produces control voltages at distinct operating threshold levels for the power circuit that correspond to four engine operating zones, i.e. engine standstill, idling, transmission gear drive, and high speed drive.

ERRATUM

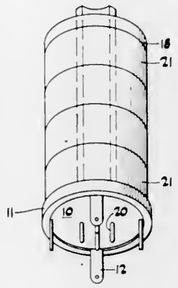
For Class 317—124 see:
Patent No. 3,579,703

3,581,157
ELECTRICAL RELAY CIRCUITRY
Frank B. Hall, Chicago, Ill., assignor to Pettibone Corporation
Filed Jan. 17, 1969, Ser. No. 792,102
Int. Cl. H01h *47/16*
U.S. Cl. 317—136 **5 Claims**



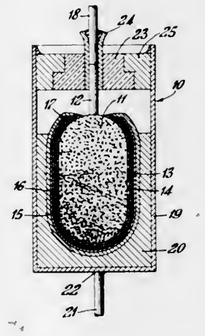
Electrical relay circuitry for performing useful work by the selective closing of work circuits. In one form of circuitry, two independent relay magnets with associated contact groups are effective upon selective energization to reverse their respective contact groups, a third contact group being automatically reversed upon energization of either relay magnet. In another form, selective energization of the magnets reverses their respective contact groups, but the third contact group is not reversed unless both magnets are energized.

3,581,158
VARIABLE STACK ELECTRICAL CONDENSER
Jerry Shirek, P.O. Box 1861, Monterey, Calif.
Filed May 19, 1969, Ser. No. 825,584
Int. Cl. H01g *9/08, 1/02*
U.S. Cl. 317—230 **6 Claims**



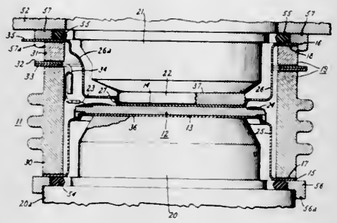
One or more toroidally shaped electrical condensers are mounted on a standard base unit provided centrally thereof with an externally threaded post that is coaxial of the condensers. A nut threaded on the post holds the condensers on the post and against the base. Metal cases for the condensers form their ground connections and all the cases ground to a peripheral metal band on the base. Contact strips are secured longitudinally of the post and are electrically connected to the base terminals. Each condenser has a spring tab forming its other connection that contacts one of the strips.

3,581,159
SOLID ELECTROLYTE CAPACITOR HAVING IMPROVED COUNTERELECTRODE SYSTEM
John Piper, Greenville, S.C., and Carl F. Leitten, Jr., Indianapolis, Ind., assignors to Union Carbide Corporation, New York, N.Y.
Filed Nov. 12, 1969, Ser. No. 875,790
Int. Cl. H01g *9/05*
U.S. Cl. 317—230 **24 Claims**



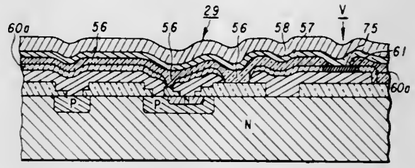
A solid electrolytic capacitor and method for the production thereof comprising a body of an anodizable metal, an oxide layer produced by anodization of the body as a dielectric, a solid semiconductive electrolyte layer over the oxide, and an electrically conductive counterelectrode system consisting of a layer of carbon particles on the solid electrolyte, a thin-walled copper lamellar coating over the carbon layer, and an electrical connection to the copper lamellar coating.

3,581,160
SEMICONDUCTOR RECTIFIER ASSEMBLY HAVING HIGH EXPLOSION RATING
Dante E. Piccone, and Daniel B. Rosser, both of Philadelphia, Pa., assignors to General Electric Company
Filed Dec. 23, 1968, Ser. No. 786,251
Int. Cl. H01l *1/08, 1/14*
U.S. Cl. 317—234R **10 Claims**



The main electrodes of a sealed semiconductor device are clamped between opposing metal members of a pressure assembly, and gaps between opposite ends of the insulating sidewall of the device and the respectively adjacent metal members are closed by resilient O-rings disposed in compression in the gaps and respectively circumscribed by rigid retaining rings.

3,581,161
MOLYBDENUM-GOLD-MOLYBDENUM INTERCONNECTION SYSTEM FOR INTEGRATED CIRCUITS
James A. Cunningham, and Robert S. Clark, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Continuation of application Ser. No. 606,064, Dec. 30, 1966, now abandoned. This application Jan. 2, 1969, Ser. No. 791,862
Int. Cl. H01l *5/02*
U.S. Cl. 317—234R **17 Claims**

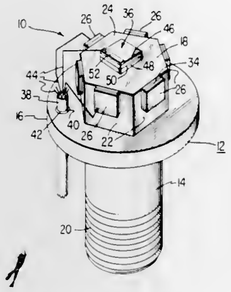


There is disclosed a multilevel contact and interconnection system for integrated circuits comprising at least three levels. Ohmically connecting to the semiconductor through an opening in its insulating layer is a first layer of molybdenum. The second layer is of gold and the third of molybdenum. This system is virtually alloyless since the molybdenum does not alloy with the semiconductor material or the gold.

3,581,162
OPTICAL SEMICONDUCTOR DEVICE
William Richard Wheatley, Somerville, N.J., assignor to RCA Corporation
Filed July 1, 1969, Ser. No. 838,198
Int. Cl. H01l *1/12, 9/06*
U.S. Cl. 317—234 **8 Claims**

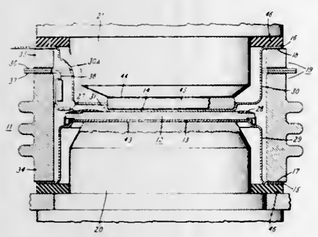
An optical semiconductor device comprises a metal supporting member having a mounting stem, a flat head on one end of the stem and a hub on the head. The hub has an end surface and a peripheral surface. A plurality of electroluminescent semiconductor diodes are mounted in spaced relation on the peripheral surface of the hub so that the supporting member is one terminal of each of the diodes. A terminal

wire extends through and is insulatingly supported on the head of the supporting member. The terminal wire is electrically connected to each of the diodes so as to be the other terminal of the diodes. The diodes are all positioned so that they are adapted to emit light in the same direction away



from the head of the supporting member. An additional electroluminescent semiconductor diode may be mounted on the end surface of the hub and electrically connected to the supporting member and the terminal wire. The additional diode is also adapted to emit light in the same direction as the other diodes.

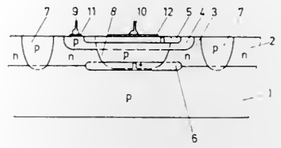
3,581,163
HIGH-CURRENT SEMICONDUCTOR RECTIFIER ASSEMBLIES
Lars O. Eriksson, West Chester, Pa., assignor to General Electric Company
Filed Apr. 9, 1968, Ser. No. 719,966
Int. Cl. H01l *1/02, 1/14*
U.S. Cl. 317—234R **8 Claims**



The thermal cycling capability of a high-current semiconductor device is significantly increased by disposed a tungsten strain buffer in compression between a terminal of the device housing and an external pressure applying thrust member.

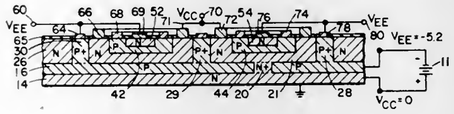
3,581,164
JUNCTION CAPACITANCE COMPONENT, ESPECIALLY FOR A MONOLITHIC MICROCIRCUIT
Hans Pfander, Freiburg; Harald Schilling, Gundelfingen, and Gerhard Schwabe, Freiburg, all of, Germany, assignors to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed June 18, 1969, Ser. No. 834,428
Claims priority, application Germany, June 26, 1968, P 17 64 556.6
Int. Cl. H01l *5/00, 7/02*
U.S. Cl. 317—234 **5 Claims**

This is a junction capacitance component which can be simultaneously formed with other planar transistors on a monolithic integrated circuit. The capacitance component achieves an improved specific capacity for the same voltage breakdown by forming an intermediate region between a wafer and an epitaxial layer, said layer containing a highly doped emitter region base and collector regions, and a highly



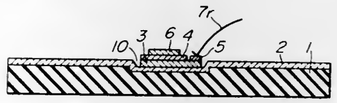
doped region which extends from said emitter, through said base and collector to, and within the marginal area of, said intermediate region.

3,581,165
VOLTAGE DISTRIBUTION SYSTEM FOR INTEGRATED CIRCUITS UTILIZING LOW RESISTIVITY SEMICONDUCTIVE PATHS FOR THE TRANSMISSION OF VOLTAGES
Walter C. Seelbach, Scottsdale, Ariz., and Kyriakos E. Lampathakis, Lake Park, Fla., assignors to Motorola, Inc., Franklin Park, Ill.
Continuation-in-part of application Ser. No. 610,915, Jan. 23, 1967, now abandoned. This application Oct. 30, 1967, Ser. No. 683,078
Int. Cl. H01l *19/00*
U.S. Cl. 317—235 **7 Claims**



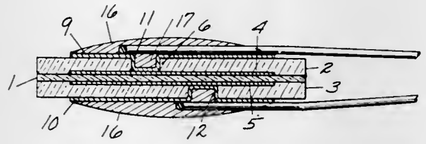
A voltage distribution system formed in a monolithic integrated circuit structure and a process for making same. Adjacent P-type and N-type conductivity semiconductor layers form respective portions of separate conductive paths for distributing electrical potentials to semiconductor devices or other components within the same integrated structure. P-type and N-type channels are formed within various portions of the semiconductor layers to complete the conductive paths, and reverse biased junctions electrically isolate the conductive paths and prevent electrical interference between same.

3,581,166
GOLD-ALUMINUM LEADOUT STRUCTURE OF A SEMICONDUCTOR DEVICE
Takayuki Suzuoka, Kodaira-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan
Filed Jan. 22, 1969, Ser. No. 792,992
Claims priority, application Japan, Jan. 29, 1968, 43/5484
Int. Cl. H01l *5/02*
U.S. Cl. 317—235 **5 Claims**



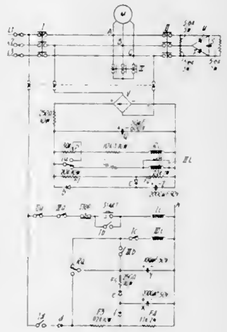
A semiconductor device, wherein a metal plate having first and second metal layers is fitted on one principal surface of an insulating substrate on which a plurality of leadout leads extend; a semiconductor substrate with a plurality of integrated circuit elements being fitted to said first metal layer; said second metal layer and the first lead being connected by a first connecting wire; and the electrodes of said circuit elements being connected to the remaining leads by the second connecting wires.

3,581,167
REINFORCED CERAMIC CAPACITOR AND METHOD OF MAKING THE SAME
Donald J. Veater; Sumner B. Hill, and Lawrence J. Ruffner, all of State College, Pa., assignors to Erie Technological Products, Inc.
Continuation of application Ser. No. 761,436, Sept. 23, 1968, now abandoned. This application Feb. 19, 1970, Ser. No. 011,929
Int. Cl. H01g *1/13*
U.S. Cl. 317—261 **7 Claims**



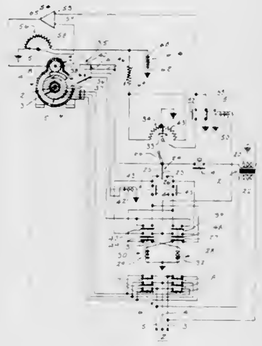
A capacitor having an extremely thin central layer (as little as 0.0002 inches) with electrodes sintered on both faces and surrounded by ceramic margins. The central layer is sandwiched between thick outer ceramic layers in face to face engagement with the electrodes and margins with the margins sintered to the outer ceramic layers to provide a unitary ceramic assembly. The outer layers have perforations providing access to the electrodes and have terminal coatings which extend into the perforations to make contact with the electrodes. Leads are soldered to and extend from the terminal coatings.

3,581,168
DYNAMIC BRAKING OF INDUCTION MOTORS
Donald Kirkby, Heckmondwike, England, assignor to BBA Group Limited, Cleckheaton, Yorkshire, England
Filed Mar. 10, 1969, Ser. No. 805,409
Claims priority, application Great Britain, Mar. 19, 1968, 13192/68
Int. Cl. H02p *3/24*
U.S. Cl. 318—211 **24 Claims**



The disclosure of this specification relates to a system for braking an induction motor comprising normally nonconducting switch means operable, when conducting, to connect capacitance means to the primary winding of the motor to effect braking of the motor and means responsive to the interruption of the supply to the motor to render the normally nonconducting switch means conducting for a period of time sufficient to bring the motor to rest.

3,581,169
REVERSING CONTROL FOR AN INDUCTION MOTOR
Romeo T. Calud, Rockford, Ill.; David L. Hansbrough, South Milwaukee, Wis., and Dean R. Zaumseil, Rockford, Ill., assignors to Bucyrus-Erie Company, Milwaukee, Wis.
Filed June 2, 1969, Ser. No. 829,449
Int. Cl. H02k *17/02*
U.S. Cl. 318—214 **9 Claims**



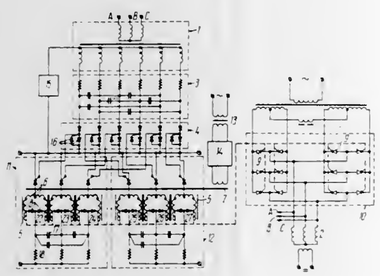
An induction motor with two equal stator segments, one being rotatably adjustable, has an electrical actuator mounted on it and controlled by a feedback control system to position the rotatably adjustable stator segment. A speed control potentiometer is ganged for operation with a master switch, which can energize either of two relays to connect the stator across a powerline for forward or reverse rotation. A limit switch is actuated by the rotationably adjustable stator segment to override the control by the master switch of the relays throughout a predetermined range of stator segment positions.

3,581,170
AUTOMATIC TORQUE CONTROL FOR A DUAL STATOR MOTOR
Donald E. Barber, Oak Creek, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.
Filed Nov. 19, 1969, Ser. No. 878,032
Int. Cl. H02p *7/36*
U.S. Cl. 318—214 **5 Claims**

A control system for a dual stator induction motor has a rotary actuator which rotates one stator to thereby control the torque produced by the motor. This torque is sensed by a watts transducer connected to measure the electrical power supplied to the motor and which generates a torque feedback signal that is linearly related to the electrical power being supplied. This feedback signal is summed with a manually adjustable reference signal which summed signal is amplified to produce a torque control signal that drives the rotary actua-

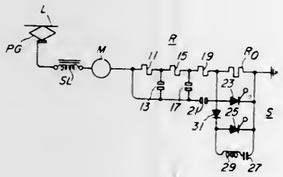
tor. The reference signal is set by the operator for the desired torque and the rotary actuator continuously positions the stator in response to the resulting torque control signal to maintain a relatively constant torque as the motor speed varies.

3,581,171
DEVICE FOR CONTROL OF A RECTIFIER MOTOR
Boris Konstantinovich Baranov, Spusk Gertsena, 11, kv. 26, and Boris Alexandrovich Stromin, ulitsa Sportivnaya 25, kv. 52, both of Novocherkassk Rostovaskoi Oblasti, U.S.S.R.
Filed Apr. 23, 1969, Ser. No. 818,617
Int. Cl. H02p *5/40*
U.S. Cl. 318—227 **4 Claims**



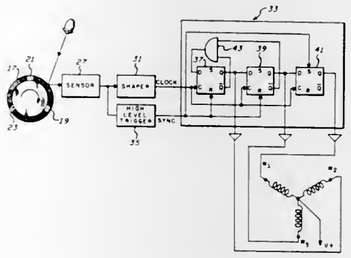
A device for control of a rectifier motor with an implicit DC network including output transformers connected to the control electrodes of the rectifying elements in a frequency (and phase) changer, and motor-voltage and supply-voltage transformers, in which the primaries of the output transformers are connected in series with the secondaries of the supply-voltage transformer, while in series with them are connected diodes which, along with said secondaries, form rectifiers producing as many impulses as there are in the output of the rectifier section of the frequency (and phase) changer, the DC circuits of said rectifiers containing commutation switches whose rectifying-element control circuits are connected to the secondaries of the motor-voltage transformer. The device may be used in a variety of electric-drive types where speed control over a broad range is sought.

3,581,172
CONTROL SYSTEM OF ELECTRIC MOTOR
Takashi Tsuboi, and Hiroshi Narita, both of Katsuta-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 1, 1969, Ser. No. 812,168
Claims priority, application Japan, Apr. 1, 1968, 43/20981/;43/25209;43/25214
Int. Cl. H02p *1/20*
U.S. Cl. 318—259 **13 Claims**



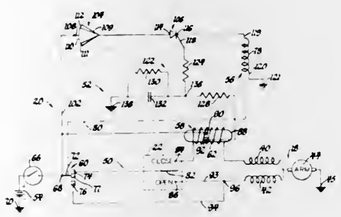
A control system for electric motors effecting variation of the electric motor current in a step-by-step operation in successive stages, second impedance control means for controlling the variation of said current by said first means in a linear fashion by providing an impedance varying from a minimum value to a maximum value during each stage of operation and control means for effecting a transition of first means from one stage to the next in response to detection of said motor current reaching a predetermined value and simultaneously changing the impedance of said second means to said maximum value.

3,581,173
LIGHT ACTUATED BRUSHLESS DC MOTOR
John L. Hood, and Joe H. Mc Gee, both of Charlottesville, Va., assignors to Sperry Rand Corporation
Filed June 9, 1969, Ser. No. 831,340
Int. Cl. H02k *29/00*
U.S. Cl. 318—254 **8 Claims**



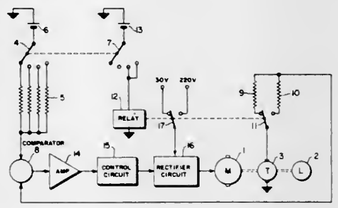
A brushless DC motor contains an odd number of stator windings. A cylindrical member is mounted integrally on the rotor and contains a narrow, axially disposed reflecting stripe on its surface corresponding to each stator winding. One of the stripes may have a high degree of light reflectivity, the other stripes may have an intermediate degree of reflectivity, the cylindrical surface between the stripes has a low degree of reflectivity. A stationary light source is arranged to reflect a narrow beam of light from the cylindrical surface onto a sensor. Each burst of light reaching the sensor when a stripe traverses the light beam produces an electrical pulse output from the sensor which switches a sequence steering circuit into a new stable state. The steering circuit has a different stable state for each stator winding and is connected to energize a different individual stator winding for each state. Successive pulses from the sensor switch the steering circuit so as to energize individual stator windings in a cyclical sequence. A burst of light from the high reflectivity stripe further actuates a high level trigger circuit that synchronizes the steering circuit during each revolution of the rotor.

3,581,174
AUTOMATIC REVERSING CIRCUIT FOR A WINDOW REGULATOR MOTOR CONTROL SYSTEM
Dale F. Hammer, Bellbrook, Ohio, assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 15, 1969, Ser. No. 870,628
Int. Cl. H02p *1/22*
U.S. Cl. 318—266 **2 Claims**



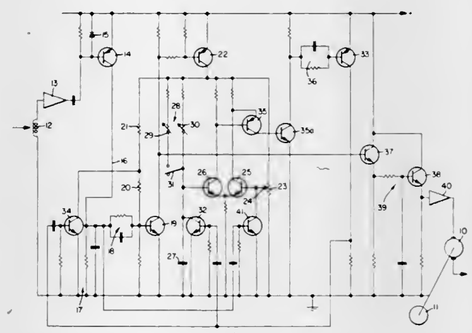
A window regulator motor control system for a drive motor operative to open and close a window includes an automatic reversing circuit incorporating an overload current relay and a reversing relay which function to reverse the motor in response to an overload current condition. The reversing relay is energized through a controlled rectifier gated conductive by a triggering circuit including a resistance-capacitance time delay network connected to the overload current relay. When the window is driven against an obstruction, the time delay network provides a momentary delay before the controlled rectifier is gated conductive and the motor is reversed.

3,581,175
SPEED CONTROL CIRCUIT WITH TWO VOLTAGE SOURCES TO ENABLE PRECISE SPEED CONTROL OVER A LARGE SPEED RANGE
Manfred Merz, Doernigheim am Main, Germany, assignor to Honeywell G.m.b.H., Frankfurt am Main, Germany
Filed Dec. 4, 1969, Ser. No. 882,199
Claims priority, application Germany, Dec. 7, 1968, P 18 13 384.1
Int. Cl. H02p *5/00*
U.S. Cl. 318—305 **3 Claims**



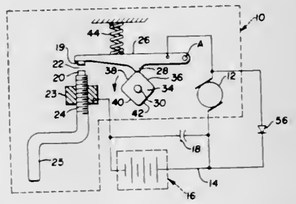
There is disclosed a control system for controlling the speed of the direct current electric motor over a wide range of speeds, for example, a speed range ratio of 1600:1. The speed of the motor is directly controlled by controlling the firing angle of a thyristor bridge network. In order to accomplish a high order accuracy over the very wide range, a voltage of a first magnitude is applied to the thyristor bridge network over a first portion of a range and a voltage of a second magnitude is applied to the thyristor bridge for a second portion of the range.

3,581,176
SYSTEM FOR DRIVING ELECTRIC MOTORS
Geoffrey James Bigg, Cholsey, and Alistair Michael Heaslett, Reading, both of, England, assignors to Ampex Corporation, Redwood City, Calif.
Filed Aug. 19, 1968, Ser. No. 753,418
Int. Cl. H02p *5/16*
U.S. Cl. 318—327 **2 Claims**



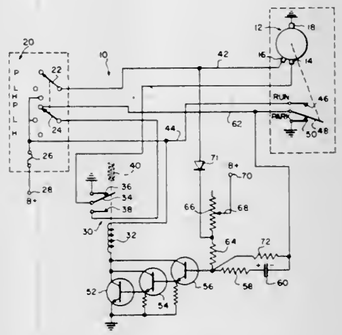
Closed loop servosystem in which an electric motor is driven by or in accordance with signals representing the difference between the actual speed of the motor and a desired nominal speed only if the actual speed is below the nominal speed. The system comprises means for providing trigger signals of a frequency in accord with motor speed, a bistable circuit which when in one state provides an output signal to drive the motor, means responsive to the trigger signals to put the bistable circuit in said one state after a predetermined time has elapsed from receipt of a trigger signal and to switch the bistable circuit to its other state on receipt of each trigger signal.

3,581,177
MOTOR SPEED CONTROL DEVICE
Louis A. Hausknecht, 4504 State Road, Cleveland, Ohio
Filed Oct. 21, 1968, Ser. No. 769,177
Int. Cl. H02p *7/06*
U.S. Cl. 318—330 **16 Claims**



A system for controlling the speed of a direct current motor. The system employs a pair of breaker points for opening and closing the circuit containing the motor. By varying the frequency of contact between the breaker points and the period of time the points are in contact, different pulsations of current are transmitted to the motor to regulate its speed.

3,581,178
WINDSHIELD WIPER CONTROL DEVICE
Robert W. Kearns, 20524 Rutherford, Detroit, Mich.
Filed Apr. 10, 1969, Ser. No. 815,060
Int. Cl. B60s *1/08*
U.S. Cl. 318—443 **10 Claims**

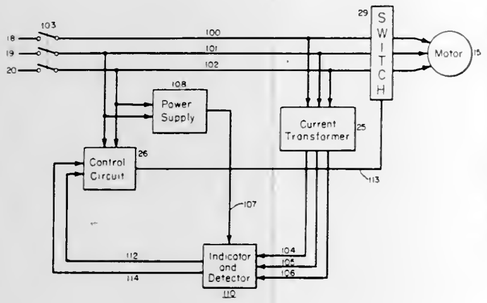


An electric control device controlling a wiper motor to operate windshield wiper blades intermittently with a dwell period between successive wiping cycles. The wiper motor current is carried by relay contacts and a solid state timing circuit controls the energization of the relay coil.

3,581,179
MULTIPHASE MOTOR CONTROL SYSTEM WITH OVERCURRENT AND UNDERCURRENT PROTECTION
Johnny W. Jones, Tulsa, Okla., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Sept. 11, 1969, Ser. No. 857,078
Int. Cl. H02p *3/00*
U.S. Cl. 318—452 **5 Claims**

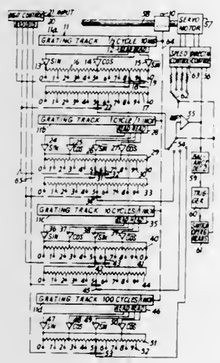
A multiphase motor control system includes an indicator and detector assembly having a meter relay for each phase circuit. Each meter relay has a pair of light-activated silicon

controlled rectifiers (LASCR's) which are normally conductive when illuminated from a pair of lamps indicating the phase current is below a high level setting, and above a low level setting. If any phase current exceeds the high level setting, the meter movement displaces a shutter which blocks the light from the high-current lamp, deenergizing the LASCR and deenergizing a first control relay, which is coupled to all the high-current circuits, to shut down the system.



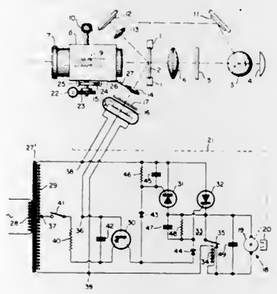
Correspondingly, decrease of any phase current below the preset low level causes a reduction of illumination on the low level SCR, and drops out a second control relay, also coupled to the other low-current circuits. The control circuit includes the first and second control relays and associated components for regulating, consonant with suitable time delay, energization and deenergization of the motor. A single power supply energizes the meter relays and the control relays in the control circuit.

3,581,180
HIGH SPEED ABSOLUTE POSITION CONTROLS
Alexander Russell; ; , and Alastair Gordon Millar, both of National Engineering Lab., East Kilbride, Glascow, Scotland
Filed Feb. 28, 1969, Ser. No. 803,294
Claims priority, application Great Britain, Feb. 29, 1968, 9955/68
Int. Cl. G05b *1/06*
U.S. Cl. 318—608 **14 Claims**



An arrangement for controlling the positioning of a movable object by power drive means along a defined movement path in accordance with an applied digital position command which comprises power drive means operative to cause movement of said object in either direction along said path, electric waveform generating means for generating at least two families of electric waveforms related to the absolute position of said object, each of said families comprising a group of different waveforms which each pass through a chosen datum level of amplitude at different positions of said object along its movement path, the unit distance displacement between adjacent waveforms of one group being an integral multiple of the unit distance displacement of the other family or families, position selection means for selecting under said applied digital position command particular position defining waveforms derived one from each of said families of waveforms, datum level detection means operative to provide a control signal in response to passage of an applied waveform signal through said datum level, servo control means for causing operation of said power drive means in one or other direction in response to an applied error signal and cyclically operable step-by-step switch means for successively applying said selected position defining waveforms in turn and in progressively decreasing order of unit displacement distance to said datum level detection means and said servo control means, the control signals from said datum level detection means being operative to control the step-by-step operation of said cyclically operable switch means.

3,581,181
SERVOMOTOR DRIVING AND BRAKING CIRCUIT
Robert H. Wallace, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Sept. 13, 1968, Ser. No. 759,546
Int. Cl. G05f *1/00*
U.S. Cl. 318—640 **6 Claims**

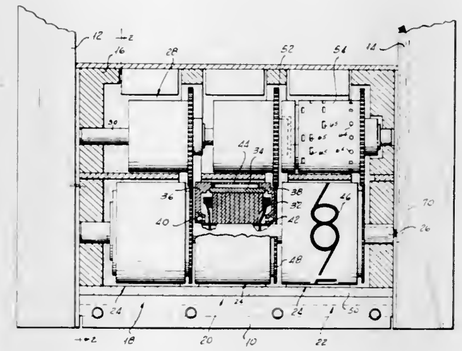


Two AC energized back-to-back silicon-controlled rectifiers power a motor which positions both the projection lens of a projector and a beam of light reflected from a slide in the projector. This beam falls on a pair of photosensitive resistors in an AC bridge circuit which is balanced when the beam is centered on the resistors, and which produces an output voltage for controlling the rectifiers through a transistor when the beam is displaced from center by the shifting of the slide from a focused position. The rectifiers then drive the motor to return the beam to the balance position and deenergize the motor. The concurrent movement of the projection lens refocus the slide. The contacts of a reed switch, having its coil connected in series with the motor, short circuit the latter to brake its motion whenever the motor is not energized.

3,581,182
DIGITAL INDICATOR STEP MOTOR SYSTEM
David W. Comstock, Milford, and Edwin R. Campbell, Monroe, both of, Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Feb. 8, 1967, Ser. No. 614,679
Int. Cl. G05b *19/40*
U.S. Cl. 318—685 **7 Claims**

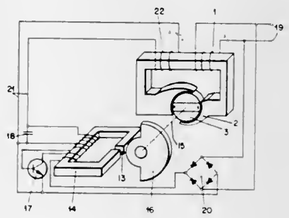
A digital indicator system in which a command signal activates a switching network selectively to couple digitally generated, bipolar, phase-displaced signals to the two-phase

internal stator windings of a stepper motor having an outer permanent magnet rotor to cause the rotor always to step in the same direction no matter at what time the switching network is activated by the command signal. The rotor locks magnetically onto the stator poles of one phase when the



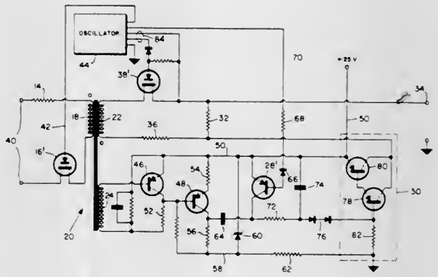
input to the motor disappears. Miniature code drums driven by the stepper motor rotors provide feedback signals which are compared with the command signal to deactivate the switching network when the rotors reach the commanded positions.

3,581,183
CHARACTER INDICATOR WITH MEANS FOR MONITORING THE CORRECT POSITIONING
Gian-Franco Piazza; Rudolf Streit, both of Solothurn, Switzerland; Martin Ulrich, Frankfurt am Main; Werner Laber, Mainflingen; Adolf Burkert; Manfred Tron, Walldorf, and Wolfgang Waluga, Frankfurt am Main all of, Germany, assignors to Autophon Aktiengesellschaft, Solothurn, Switzerland
Filed Feb. 2, 1970, Ser. No. 7,686
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 **27 Claims**



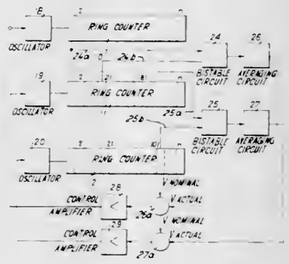
A character indicator system for sequentially displaying data and having means to monitor the characters indicated to thereby determine the correctness of the display. The character carriers are advanced by a step-by-step motor which advances one step for each alternation of the input energy. The monitor means, as a function of the position of the character carrier or the motor armature, affects at least one alternating current signal whose frequency lies within the order of magnitude of several times the frequency of the energy used for driving the motor. Switch means feed the alternating current signal to the motor input where it can be picked up at the other end of the input and used for monitoring purposes.

3,581,184
ISOLATOR FOR DC SIGNAL TRANSMITTER
Edward T. E. Hurd, III, Burlington County, N.J., assignor to Honeywell Inc., Minneapolis, Minn.
Filed May 19, 1969, Ser. No. 825,873
Int. Cl. H02m *3/32;* **H03f** *3/38;* **G01r** *19/18*
U.S. Cl. 321—2 **8 Claims**



There is disclosed a signal isolator for DC signals which includes a closed-loop, magnetic induction null-balanced output circuit. The DC input signals are chopped and applied as input signals to a first or input winding on a transformer. A sensing winding of the transformer detects the net flux in the transformer core. The signal thereby produced is amplified and converted to a DC output signal. A portion of the output signal is chopped and applied as feedback signal to a third or feedback winding on the transformer. The feedback signal is synchronous with the signal applied to the input winding and is applied to the feedback winding in such a way that the flux produced thereby opposes the flux produced by the signal in the input winding. The sensing winding detects any net flux resultant from the opposed input and feedback signals.

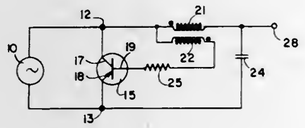
3,581,185
ELECTRIC CIRCUIT FOR GENERATING A PROGRAMMABLE MULTIPHASE ALTERNATING CURRENT
Heinz Hermes; Klaus-Dietrich Thieme, Wedel, Holstein; Willi Gatermann, Hamburg; Peter Koerv, Anzing, and Walter Mehnert, Munich, all of, Germany, assignors to LICENTIA Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany
Filed Dec. 16, 1968, Ser. No. 784,020
Claims priority, application Germany, Dec. 15, 1967, 1,588,510
Int. Cl. H02m *5/14*
U.S. Cl. 321—7 **9 Claims**



A circuit for producing a multiphase alternating current which may be programmed in wave shape, includes a separate oscillator producing an alternating signal for each phase, a ring counter receiving the output of the oscillator whose stages deliver successive outputs which subdivide a given period, an interrogating switching circuit connected to each output of the ring counter and to a separate bar of a

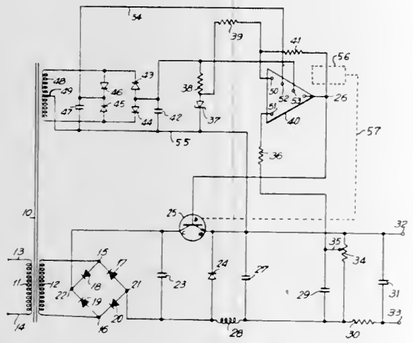
crossbar distribution panel for receiving a characteristic voltage from that bar and switching it to the input of an amplifier upon receiving a pulse from the associated output of the ring counter. Circuit elements for shifting the phase relationship include a bistable circuit means having a first input connected with one stage of one ring counter and a second input connected to a stage of another ring counter, an averaging circuit for averaging the output signals of the bistable circuit means, and means utilizing the said averaged signals for supplying an input signal to one of the oscillators. The frequency of the oscillator signals may be directly varied by the input signal to vary the frequency and, consequently, the phase relationship of the multiphase signal.

3,581,186
REDUCED FORWARD VOLTAGE DROP RECTIFYING CIRCUIT
Aaron David Weinberger, Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Mar. 19, 1969, Ser. No. 808,622
Int. Cl. H02m *7/12*
U.S. Cl. 321—43 **5 Claims**



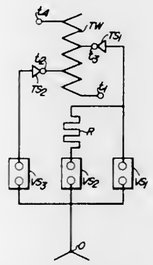
A dynamic rectifying device uses a transistor biased to saturation as the rectifying element. The lower voltage drop between collector and emitter of a saturated transistor (as compared with the diode voltage drop) provides increased rectifying efficiency and better clamping action. The circuit includes a bias network using the input alternating current signal to develop the proper bias voltage for the circuit.

3,581,187
REGULATED DC POWER SUPPLY
Charles B. Grady, Jr., West Orange, N.J., assignor to The Metrodynamics Corporation, Carlstadt, N.J.
Filed June 23, 1969, Ser. No. 835,717
Int. Cl. G05f *1/58, 1/64*
U.S. Cl. 323—17 **8 Claims**



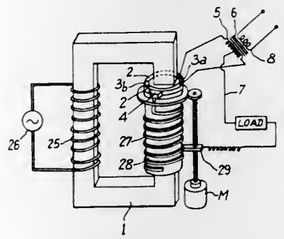
A regulated DC power supply wherein the main pass transistor is connected to an operational amplifier having a positive feedback which rapidly switches the main pass transistor on and off, rather than maintaining transistor continuously on, so as to intermittently supply DC power from a rectified source to the output of the supply while maintaining the voltage of the output within predetermined limits of voltage regulation for various loads and line current fluctuations. By rapidly switching the main pass transistor, it is possible to significantly reduce its heat dissipation and therefore reduce the size and cost of the power supply.

3,581,188
SWITCHING DEVICE FOR ON-LOAD TAP CHANGERS OF REGULATING TRANSFORMERS
Ryozi Watanabe, and Yutaka Kobayashi, both of Hitachi-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Mar. 10, 1969, Ser. No. 805,487
Claims priority, application Japan, Mar. 13, 1968, 43/15853
Int. Cl. H01f *29/04;* **H02p** *13/06*
U.S. Cl. 323—43.5 **22 Claims**



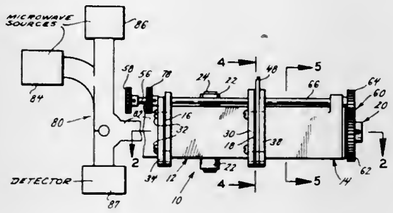
A switching device for an onload tap changer of a regulating transformer, in which use is made, instead of contacts, of vacuum switches operable without generating an arc exteriorly, the said vacuum switches being arranged along the sides of a polygonal shape in such a manner that those vacuum switches which are operated in the same switching sequence are located in a group on one and the same side of the said polygonal shape, and operated for opening and closing actions in accordance with the switching sequence from a drive shaft through a link mechanism provided for each group, whereby maintenance of the switching device is facilitated and the operation of the vacuum switches can be controlled easily.

3,581,189
ON-LOAD VOLTAGE REGULATORS
Maurice Sinet, 45 Blvd. Stalingrad 92, Antony, France
Filed July 2, 1969, Ser. No. 838,615
Claims priority, application France, July 3, 1968, 157,661
Int. Cl. H01f *29/04;* **H02p** *13/06*
U.S. Cl. 323—43.5R **6 Claims**



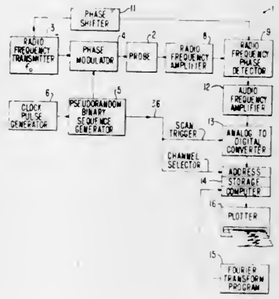
An on-load voltage regulator comprises a transformer having a magnetic core, a primary winding on the core, and a rotatable secondary winding in the form of a bare wire conductor coiled helically around the core. A brush cooperates with the second winding and is movable axially but not angularly relative to the secondary winding. A slip ring connector at one end of the secondary winding has fixed elements and an element which bridges the fixed elements and which is connected to the end of the secondary winding and is rotatable therewith. An inverse potential is applied between the fixed elements for the purpose of maintaining the potential between the fixed elements at a zero value in use when they are bridged by the rotatable element of the slip ring connector.

3,581,190
MICROWAVE RESONANCE SYSTEMS EMPLOYING A BIMODAL CAVITY
Ian McLaren Brown, St. Louis, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.
Filed Sept. 17, 1968, Ser. No. 760,234
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 **20 Claims**



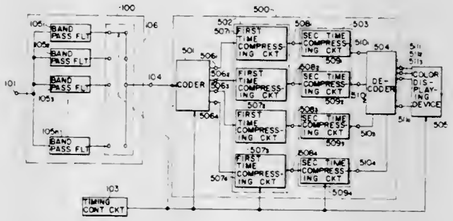
A bimodal microwave cavity structure having separate communicating cavity portions, one of which includes means for positioning a sample or specimen, said cavity structure being able to be resonant in more than one mode such that the sample or specimen when positioned at a suitable location in one of the structure cavities can interact with the fields associated with all modes that are present. The present structure is a relatively simple inexpensive device which can be used to gather information and particularly information from which relatively complex characteristics of specimen substances can be determined. The present structure can also be used in the construction of two level maser devices as well as in other devices.

3,581,191
PHASE CORRELATION FOR AN RF SPECTROMETER EMPLOYING AN RF CARRIER MODULATED BY A PSEUDORANDOM SEQUENCE
Weston A. Anderson, Palo Alto, Calif., assignor to Varian Associates, Palo Alto, Calif.
Filed Aug. 6, 1969, Ser. No. 847,859
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 **11 Claims**



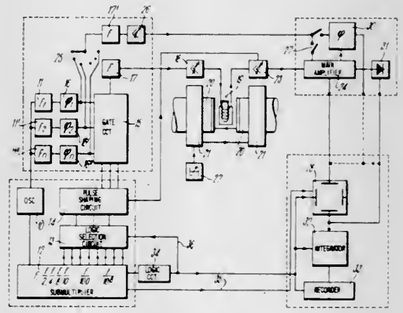
The radio frequency spectrometer is disclosed employing a radio frequency transmitter which transmits a wide band of energy to the sample for simultaneously exciting radio frequency resonance of different spectral lines of the sample. The wide band transmitter energy is generated by a radio frequency carrier which is modulated by a pseudorandom binary sequence to produce the wide bandwidth for exciting the sample. The pseudorandom binary sequence is repetitive and the excited composite resonance signal is repetitively time scanned and sampled at a multiplicity of intervals during each scan. The sampled data derived from repetitive scans are digitized and sequentially stored and added in their respective channels of a storage unit to produce a time average for improving the signal noise ration. The pseudorandom binary sequence is synchronized with the time scan of the composite resonance signal to preserve the phase relation between successively sampled and stored data from successive scans, whereby either pure absorption or pure dispersion mode resonance data is obtained.

3,581,192
FREQUENCY SPECTRUM ANALYZER WITH DISPLAYABLE COLORED SHIFTABLE FREQUENCY SPECTROGRAM
Tanetoshi Miura, Kokubunji-shi; Tsuneji Koshikawa, Tokorozawa-shi; Yasuaki Nakano, Hino-shi, and Takeshi Nakayama, Hino-shi, all of, Japan, assignors to Hitachi, Ltd., Tokyo-To, Japan
Filed Nov. 13, 1968, Ser. No. 775,343
Int. Cl. G01r *23/16*
U.S. Cl. 324—77 **11 Claims**



Sound signal is analyzed so that there are provided a plurality of different constituent frequency components by means of a set of band-pass filters, and the thus analyzed frequency components are time-sequentially supplied to a color display which employs a color picture tube and its associate circuits for displaying different colors representative of the intensities of the frequency components.

3,581,193
PULSE SPECTROMETER EMPLOYING SEQUENCES OF SYNCHRONIZED MODULATED PULSES
Gunther R. Laukien, Forchheim Karlsruhe, Germany
Filed Nov. 4, 1968, Ser. No. 772,979
Claims priority, application Germany, Nov. 2, 1967, B952101
Int. Cl. G01n *27/78*
U.S. Cl. 324—0.5 **15 Claims**



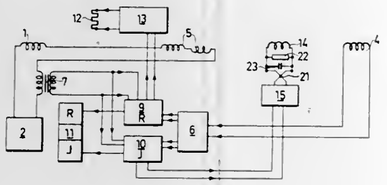
Pulse spectrometer, preferably for measurement of nuclear resonance of a material, having one or many high frequency measuring channels or having variable high frequency measuring ranges, characterized in that all pulse spacing periods within the pulse measuring programs and the HF carrier frequency of the HF pulses employed are derived from a common source of high frequency oscillations, so that the

pulses commence only at specific, i.e. statistically nonfluctuating, phase values of the HF carrier frequency.

3,581,194
TEMPERATURE RESPONSIVE MEANS FOR AUTOMATICALLY CORRECTING VARIATIONS IN THE COMPENSATION OF AN ELECTROMAGNETIC PROSPECTING DEVICE

Ruben Tegholm, Johanneshov, Sweden, assignor to Atlas Copco Aktiebolog, Nacka, Sweden

Filed Feb. 4, 1969, Ser. No. 796,399
Claims priority, application Sweden, Feb. 6, 1968, 1568/68
Int. Cl. G01v *3/12, 3/16*
U.S. Cl. 324—6 **6 Claims**

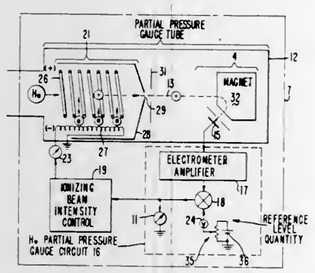


In an electromagnetic prospecting device having both a transmitter coil and a receiver coil mounted on the same frame, an auxiliary transmitter coil is provided on the frame intermediate the transmitter and receiver coils for compensation of the influence of the primary field, generated by the transmitter, on the receiver, there also being means for automatically correcting variations in the compensation due to changes in the distance between the transmitter and receiver coils caused by fluctuations in temperature and forces to which the device is exposed.

3,581,195
DETECTION OF VACUUM LEAKS BY GAS IONIZATION METHOD AND APPARATUS PROVIDING DECREASED VACUUM RECOVERY TIME

Robert L. Jepsen, Los Altos, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed June 10, 1968, Ser. No. 735,695
Int. Cl. G01n *27/62*
U.S. Cl. 324—33 **6 Claims**

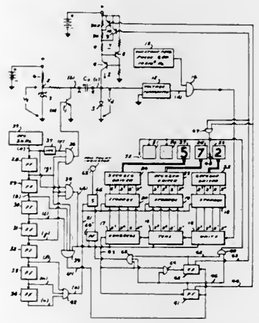


A vacuum leak detecting method and apparatus is disclosed. An evacuated vacuum envelope structure to be tested for leaks is probed exteriorly with a jet of probe gas, such as helium. A certain fractional proportion of probe gas constituent which leaks through the probed vacuum envelope structure is ionized by a leak detector apparatus connected in gas communication with the structure being tested. The ionized probe gas constituent is collected to produce an ion current signal. The ion current signal is monitored to obtain a measure of the partial pressure of the probe gas constituent for detecting leaks. The fractional proportion of the probe gas which is ionized is varied inversely with the partial pressure of the probe gas constituent, whereby reemission of ionically pumped gas within the pressure measuring system is minimized, in use, to decrease the recovery time of the leak detector in its high sensitivity range. In one embodiment of the present invention, a comparator circuit is provided for comparing the amplitude of the ion current signal with a reference signal to derive a control signal for controlling the intensity of a ionizing bema of electrons utilized to ionize the probe gas constituent.

3,581,196
DIGITAL CAPACITANCE METER BY MEASURING CAPACITOR DISCHARGE TIME

William L. Spaid, R.R. #1, South River Road, Cedarville, Ohio

Filed Oct. 28, 1968, Ser. No. 771,026
Int. Cl. G01n *11/52*
U.S. Cl. 324—60R **6 Claims**



A fully automatic capacitance meter with decimal readout. The meter operates cyclically at a relatively high frequency, acting in an initial small fraction of each cycle to charge the unknown capacitor to a predetermined voltage, discharge the capacitor at a constant rate to zero voltage, measure the time interval required for discharge to produce a time analog of the capacitance, and convert the time analog to a decimal number. The remaining large fraction of each cycle is used to display the decimal number. Automatic range switching is accomplished by changing the discharge rate.

3,581,197
CAPACITANCE MOISTURE METER AND WINGLIKE PROBE

Dennison H. Morey, Jr., 55 Irwin Lane, Santa Rosa, Calif.; Melvin Silva, P.O. Box 3276, Hayward, Calif., and Gordon D. Browning, 19056 Stanton Ave., Castro Valley, Calif.

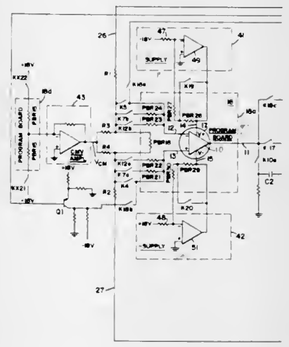
Continuation-in-part of application Ser. No. 664,112, Aug. 29, 1967, now abandoned. This application Oct. 3, 1969, Ser. No. 863,665
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 **5 Claims**

Free moisture in yieldable matter (defined to include water, alcohols, and other liquids of relatively high dielectric constants occurring on the surface of solids or as drops in another liquid) is measured by an instrument which includes a radio frequency oscillator (e.g., 2 MegHz.), preferably voltage-stabilized, connected to an LC circuit that can be made substantially resonant, one of the elements being a capacitance probe, and the potential over one of these elements is measured to indicate the moisture content. The probe preferably includes an outer sheath of metal which partly covers a body of moisture-impermeable dielectric material and leaves a part of the surface of the material exposed, and an inner conductor embedded in the material and thereby completely insulated from the outside of the probe; the capacity between the sheath and conductor varies with the amount of moisture which contacts the exposed surface of the body. When testing material of variable density, such as soil, the probe is placed within the material and the latter is compacted to a predetermined degree if required.

3,581,198
TESTING APPARATUS FOR ELECTRICAL DEVICE WHERE A STIMULUS IS VARIED BETWEEN TWO STATES

William E. Shoemaker, Los Altos, and David W. Wilson, Sunnyvale, both of, Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Filed Jan. 8, 1969, Ser. No. 789,721
Int. Cl. G01r *15/12*
U.S. Cl. 324—73 **13 Claims**



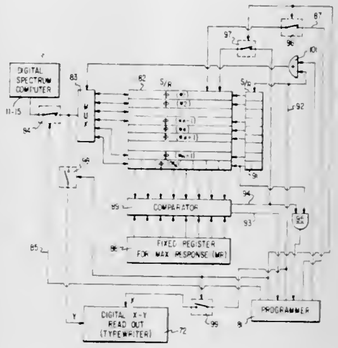
Testing apparatus for testing electrical devices such as operational amplifiers which sequences through a series of tests each test having first and second test halves during which a parameter of the device is varied between two states. The apparatus can be used for pass-fail testing of electrical devices or alternatively for sorting by selective display of the quantitative test information for any desired parameter. This is accomplished by providing a pushbutton for each test; by depressing the pushbutton associated with the test the quantitative information is displayed.

3,581,199
SPECTRUM ANALYZER INCLUDING SAMPLING AND SCALING MEANS

David A. Spitz, Columbus, Ohio, assignor to Industrial Nucleonics Corporation

Filed Sept. 1, 1967, Ser. No. 665,135
Int. Cl. G01n *23/16*
U.S. Cl. 324—77 **35 Claims**

Disclosed is a digital spectrum analyzer wherein the spectral content at a plurality of frequencies w_m is computed in response to Fourier transforms at each frequency of an analyzed signal at a plurality of discrete time intervals. The Fourier transforms over each interval are combined to indicate the Fourier transform over the entire interval being considered. A further disclosed feature relates to determining with a specific degree of certainty whether a frequency component is periodic. The determination is made by multiplying average power spectrum density over all the frequencies by a predetermined factor, dependent upon the degree of certainty desired. If the spectral density at a particular frequency is greater than the product, it can be assumed, with the

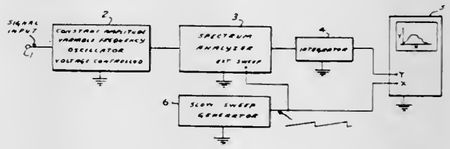


predetermined degree of certainty, that the frequency is periodic. Another disclosed feature concerns automatically scaling the amplitudes of the spectral responses at a plurality of predetermined frequencies, whereby no off-scale readings are obtained.

3,581,200
APPARATUS FOR DERIVING THE PROBABILITY DENSITY FUNCTION OF A SIGNAL WITH RESPECT TO AMPLITUDE

Ralph W. Mifflin, R. D. 4, Rome, N.Y.

Continuation-in-part of application Ser. No. 531,649, Feb. 25, 1966. This application Feb. 18, 1969, Ser. No. 800,239
Int. Cl. G01r *23/16*
U.S. Cl. 324—77R **2 Claims**



The probability density function of a signal the amplitude of which is the variate is derived by first producing a constant amplitude FM wave the instantaneous frequency of which is linearly related to the instantaneous amplitude of the signal. A spectrum analyzer and integrator are then used to derive the energy-frequency distribution of the FM wave. This distribution is the probability density function of the signal and is displayed on a suitable X-Y display device synchronized with the spectrum analyzer sweep.

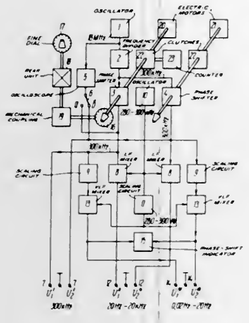
3,581,201
PHASE-SETTING DEVICE

Svyatoslav Anatollevich Kravchenko, Kirovsky Prospekt,65,kv.29, and Alexei Alexeevich Kulemin, Kubinskaya ul.,28,kv.33, both of Leningrad, U.S.S.R.

Filed May 7, 1969, Ser. No. 822,407
Int. Cl. G01r *25/00*
U.S. Cl. 324—83 **4 Claims**

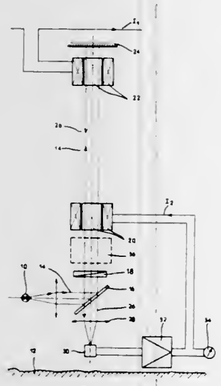
A phase-setting device for very low, low and high frequen-

cies, comprising phase-shifters, scaling circuits, very low frequency and low frequency mixers, and a variable-frequen-



cy oscillator, securing high accuracy of phase-shift setting over a broad range of frequencies from very low to high.

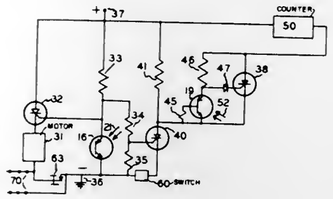
3,581,202
DEVICES FOR THE ELECTRO-OPTICAL MEASUREMENT OF AN ELECTRICAL QUANTITY
Yves J. Pelenc, La Tronche, and Georges M. Bernard, Saint Egreve, both of, France, assignors to Merlin Gerin, Societe Anonyme,, Grenoble, France
Filed Aug. 15, 1968, Ser. No. 752,927
Claims priority, application France, Sept. 1, 1967, 119,802
Int. Cl. G01r *19/08*
U.S. Cl. 324—96 **3 Claims**



Electro-optical measuring device for high-voltage overhead lines wherein a light beam is directed to the line and reflected to the earth surface and whereby both the upwardly directed light beam and the reflected light beam follow the same path and traverse the same measuring devices.

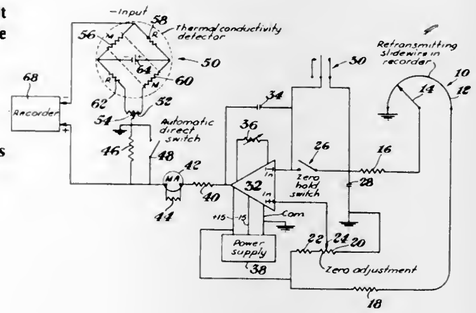
3,581,203
ANALOG METER HAVING MEANS TO PROVIDE A DIGITAL READING OF THE POINTER POSITION
William Flower, 5127 Estes Ave., Skokie, Ill.
Filed Jan. 2, 1969, Ser. No. 789,099
Int. Cl. G01r *31/00, 19/26*
U.S. Cl. 324—96 **8 Claims**

The invention disclosed within this specification pertains particularly to an instrument for digitalizing the output of an



analogue device by following a meter movement and counting the meter indications from a given point down to zero.

3,581,204
ELECTROMECHANICAL RECORDER AUTOMATIC ZERO APPARATUS
Fred D. Martin, Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.
Filed Apr. 14, 1969, Ser. No. 815,865
Int. Cl. G01r *1/02, 13/04*
U.S. Cl. 324—130 **5 Claims**

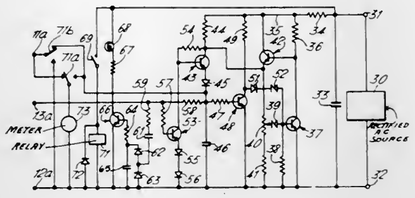


This invention relates to means for providing an automatic zero to correct periodically for instrument drift to precisely the same point each time after such drift occurred. The automatic zero means of this invention senses the position of a recorder pen and corrects the incoming signal to move the pen to a definite position. Variations that may be encountered in an electronic zero or signal condition feeding the recorder are zeroed out with the signal drift in order to position the recorder pen at a specified point.

3,581,205
APPARATUS FOR TESTING SWITCHING TYPE VOLTAGE REGULATORS BY COUNTING SQUARE WAVE PULSES PRODUCED BY THE REGULATOR
Raymond Michael Christopher Wilson, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed Mar. 25, 1969, Ser. No. 810,110
Claims priority, application Great Britain, Jan. 15, 1969, 2396/69
Int. Cl. G01r *31/28, 15/12*
U.S. Cl. 324—158 **1 Claim**

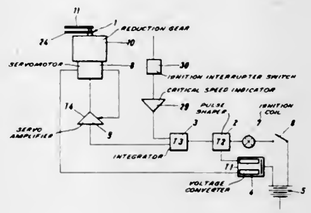
In the testing of a voltage regulator of the kind in which the regulator provides an output voltage of square wave form to a field winding, a signal is injected into the regulator representing the signal which the regulator will receive in use from a generator. The output from the regulator, which will

be of square waveform, is then fed to a counter, and an indication that the regulator is working satisfactorily is given



when a predetermined number of square waves have been counted.

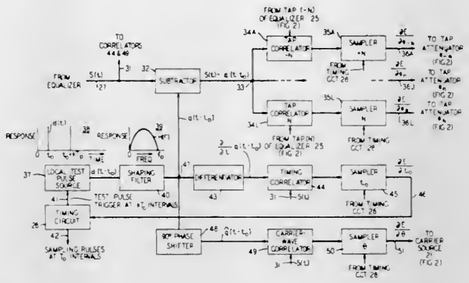
3,581,206
ELECTRONICALLY CONTROLLED SPEEDOMETER WITH MAXIMUM SPEED INDICATOR
Siegfried Strohm, Stuttgart-Stammheim, Germany, assignor to Firma Dr.-Ing. h.c. F. Porsche RG, Stuttgart/Zuffenhausen, Germany
Filed Apr. 3, 1969, Ser. No. 813,036
Claims priority, application Germany, Apr. 6, 1968, P 17 73 152.1
Int. Cl. G01p *3/48*
U.S. Cl. 324—169 **5 Claims**



An electronically controlled speedometer wherein the inductive impulses from the ignition coil whose frequency is proportional to the speed of the motor are shaped and integrated to form a control signal which is applied to a servoamplifier connected to a servomotor forming a servo loop, the servomotor driving the instantaneous speed indicator dial which in turn drags a maximum speed dial therewith in the direction of increasing speed indication, and a critical speed indicator responsive to a critical value of said control signal for interrupting the ignition circuit.

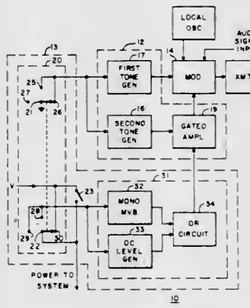
3,581,207
JOINT SETTING OF DEMODULATING CARRIER PHASE, SAMPLING TIME AND EQUALIZER GAIN PARAMETERS IN SYNCHRONOUS DATA TRANSMISSION SYSTEMS
Robert W. Chang, 82 Southview Terrace North, Middletown, N.J.
Filed Aug. 6, 1969, Ser. No. 847,881
Int. Cl. H04b *1/00*
U.S. Cl. 325—42 **10 Claims**

Apparatus and method for the joint setting in synchronous digital data transmission systems of the parameters of demodulating carrier phase, sampling time and transversal equalizer tap gains based on a common mean-square error minimization criterion. Responsive to test pulses traversing a distorting transmission medium and locally generated test pulses traversing an ideal filter simultaneous correlations are made with each equalizer tap output and the error difference between actual and ideal responses to control gap tap gains, with the derivative of the ideal response and the received signal to control sampling time, and with a quadrature transform of the received signal and the ideal response to control



demodulating carrier phase. Optimum control of these critical parameters is thereby guaranteed.

3,581,208
EMERGENCY WARNING AND IDENTIFICATION APPARATUS FOR TWO-WAY RADIO COMMUNICATION SYSTEM
William Buehrle, Jr., 333 Maplewood Road, Huntington Station, N.Y., and Gerald F. Woodard, 8 Lakeside Drive, Centerport, both of, N.Y.
Filed Dec. 16, 1968, Ser. No. 784,034
Int. Cl. H04b *7/00*
U.S. Cl. 325—64 **5 Claims**



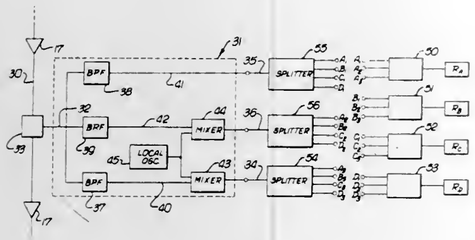
Apparatus for audio communications and other such systems are disclosed in which a plurality of portable transceivers each generate a signal having audio components and a unique combination of continuous wave frequency components, for transmission to a remote station. Manual operation of a multiposition switch in each transceiver permits indicating the existence of an emergency or nonemergency transmit condition by controlling the duration of one of the continuous wave frequency components. The transmitted signal is received at the remote station where circuitry filters and detects the unique combination of continuous wave frequency components to identify the transceiver and also determines the duration of the controllable duration component to indicate the particular transceiver's condition. Other embodiments are also covered.

3,581,209
CABLE TELEVISION PROGRAM CAPACITY ENHANCEMENT
Arie Zimmerman, 3511 W. 6th St., Los Angeles, Calif.; James A. Kuksch, 9104 Lantern Lane, and Gerald D. Smith, 6207 Breamore Rd., both of Indianapolis, Ind.
Filed Sept. 17, 1968, Ser. No. 760,158
Int. Cl. H04h *1/04;* **H04n** *7/10*
U.S. Cl. 325—308 **18 Claims**

The invention concerns a system wherein a distribution cable is operable to transmit TV signals to TV receivers each

having a limited number of local channels, the method of the invention enabling selective reception on said channels of cable distributed programs the number of which exceeds the number of said local channels, the method including,

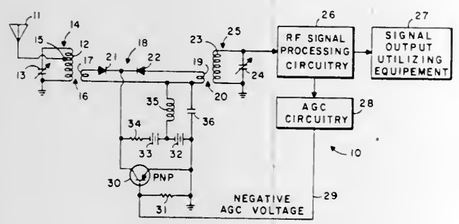
processing said signals to derive at least two groups of



resultant signals characterized in that the resultant signals of each group have carrier frequencies corresponding to those characteristic of said local channels,

and selectively and individually connecting said resultant groups of signals with the input to a TV receiver.

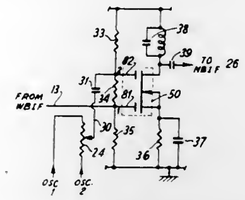
3,581,210
RF T-PAD LOW IMPEDANCE COUPLING CIRCUIT ATTENUATOR WITH AGC VOLTAGE CONTROL
Warren U. Amfahr, 3100 Brookview Drive, Plano, Tex.
Filed Jan. 23, 1969, Ser. No. 793,438
Int. Cl. H04b *1/18*
U.S. Cl. 325—411 **9 Claims**



An RF signal path variable attenuation circuit with common electrode connected diodes in the signal path and the diode interconnection connected through a transistor to ground. A voltage diode biasing circuit is also so connected in the circuit that the degree of voltage bias to conduction of the diodes is subject to variation through variable DC drain from the diode junction through the transistor along with, simultaneously, variable RF signal diversion to ground as controlled by AGC voltage variations applied at the transistor base.

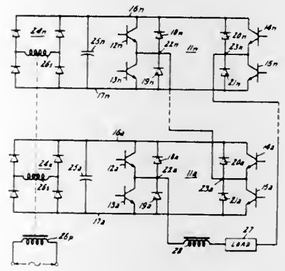
3,581,211
SYSTEM FOR SIMULTANEOUS RECEPTION OF MULTIPLE SIGNALS
Peter Maitland, and Richard W. Ehrhorn, both of Electronic Communications, Inc. P.O. Box 12248, St. Petersburg, Fla.
Filed Dec. 24, 1968, Ser. No. 786,675
Int. Cl. H04b *1/26*
U.S. Cl. 325—451 **9 Claims**

In this invention, two RF signals of different carrier frequencies and having different amplitude characteristics are received and the information content of each is used simultaneously. For example, when the RF signals carry different audio signals, this invention allows simultaneous listen-



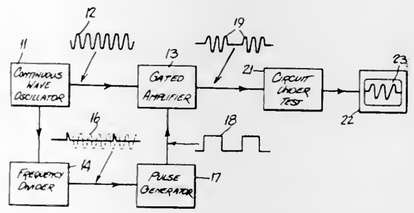
ing by developing output signals of substantially equal magnitude.

3,581,212
FAST RESPONSE STEPPED-WAVE SWITCHING POWER CONVERTER CIRCUIT
William McMurray, Schenectady, N.Y., assignor to General Electric Company
Filed July 31, 1969, Ser. No. 846,354
Int. Cl. H03b *7/14*
U.S. Cl. 328—14 **18 Claims**



To obtain fast response to a cyclical AC or variable DC input reference signal by a stepped-wave power converter circuit comprising a plurality of equal or unequal inverter modules connected in series or parallel so that the module output voltages add algebraically, the composite instantaneous output stepped-wave voltage is compared with the instantaneous voltage values of the limits of a control band placed about the reference signal. One or more inverter modules are switched to produce a step change whenever the composite output voltage is outside the control band limits. An application is a fast response switching power amplifier for driving sonar transducers.

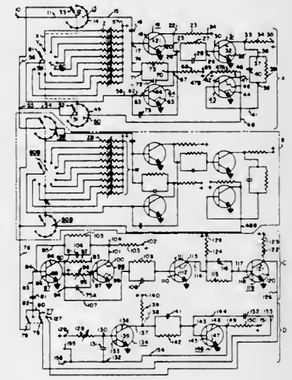
3,581,213
SYNCHRONIZED BURST GENERATOR
Elmo E. Crump, 63 Grover Lane, West Caldwell, N.J.
Filed May 9, 1968, Ser. No. 727,857
Int. Cl. H03b *19/00*
U.S. Cl. 328—25 **4 Claims**



A burst generator including a continuous wave oscillator, means to synchronize a pulse generator to the oscillator so

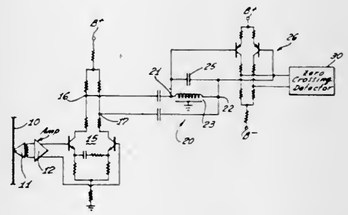
that each pulse starts at a corresponding point on a cycle of the continuous wave, and a gating circuit actuated by the pulses to transmit repetitive bursts of oscillations, each starting at a corresponding point of a cycle.

3,581,214
DISCRETELY VARIABLE TIME DELAY SYSTEM HAVING SUBMULTIPLE, ADDITIVE, AND ALTERNATIVE DELAY SELECTION
Ben L. Seegmiller, 2235 E. 21st St., Salt Lake City, Utah
Filed June 19, 1969, Ser. No. 834,817
Int. Cl. H03k *5/159, 5/04*
U.S. Cl. 328—55 **5 Claims**



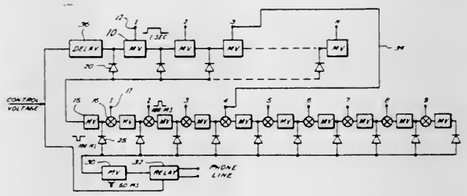
A time-delay system wherein an input signal triggers the generation of an output signal or pulse that can be accurately controlled as to time delay relative to the input signal, and preferably also as to pulse width. In a preferred form of the invention, the system includes plural circuits the delayed output of a first of which triggers the second, and so forth. Selected time delays of the plural circuits are additive, when desired, and pulse width and polarity are to be predetermined in the final output stage. Switching means are provided to connect in desired fashion one or more selected circuits to the output of the system, and one-shot multivibrators and pulse shaping stages are preferably used in each circuit. Precision resistance-capacitance circuits preferably assist to provide a stepped sequence of time delays as to each respective circuit, and the sequence of respective circuits are preferably related in a submultiple, time-delay relationship.

3,581,215
VARIABLE FREQUENCY DELAY LINE DIFFERENTIATOR
Forrest C. Meyer, San Diego, Calif., assignor to Systems Peripherals Division, San Diego, Calif.
Filed May 22, 1969, Ser. No. 826,839
Int. Cl. H03k *5/159*
U.S. Cl. 328—56 **10 Claims**



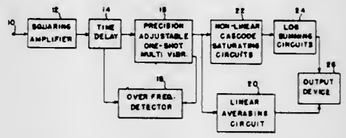
A circuit for processing a transducer readout signal is disclosed in which a frequency dependent variable length delay line is connected across a double ended output of a signal amplifier.

3,581,216
PULSE GENERATOR AND ENCODER
Louis A. Stevenson, Jr., 4010 Overbrook, Houston, Tex.
Filed Nov. 24, 1967, Ser. No. 685,391
Int. Cl. H03m *1/26*
U.S. Cl. 328—61 **8 Claims**



A pulse generating circuit particularly useful as an encoder for automatic electronic dialing equipment including a plurality of serially connected first monostable circuits, a plurality of serially connected second monostable circuits with gate means connected therebetween, means connecting each of said first monostable circuits to the first circuit of said second monostable circuit, means for connecting each said first monostable circuits to a control terminal of said gate means, and means connected with each of said second monostable circuits for receiving a pulse train. Each of the first monostable circuits may correspond to a digit of a plural digit number, and each of the second monostable circuits may correspond to a value of each digit.

3,581,217
FREQUENCY TO DIRECT CURRENT CONVERTER CIRCUIT
Wayne R. Isaacs, 7709 Suburbia St., Houston, Tex.
Filed Nov. 5, 1968, Ser. No. 773,433
Int. Cl. H03b *3/04*
U.S. Cl. 328—140 **22 Claims**

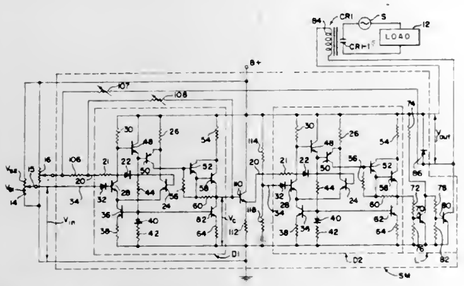


A system is disclosed for converting a periodic signal into a direct current signal that is proportional to and/or a predetermined nonlinear function of the frequency of the periodic signals. The input signals are converted into pulse type signals having a constant amplitude and preset time duration. These pulse type signals are applied to an averaging circuit for providing a direct current output proportional to the frequency and/or to a saturable circuit for providing a direct current signal that is a nonlinear function of the applied frequency. A circuit is included to determine when input frequency has a period shorter than the pulse type signals.

3,581,218
SMOOTHLY ACTING SIGNAL COMPARATOR
Bill J. Ransdell, 1915 24th St., Moline, Ill.
Filed Aug. 26, 1968, Ser. No. 755,319
Int. Cl. G06g *7/14;* **H03b** *3/02;* **H03k** *5/20*
U.S. Cl. 328—146 **7 Claims**

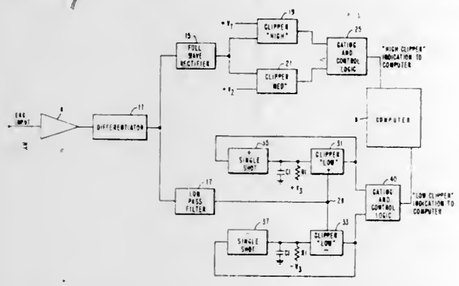
There is provided a signal monitoring circuit, for use with a signal source having a high internal impedance, for providing an output signal when a received input signal attains a predetermined value relative to a comparison signal, including means for developing the comparison signal; and, bistable circuit means having an input circuit for receiving the input signal, and an output circuit. The bistable circuit means being normally in a first condition and being actuated to a second condition when the input signal attains the predeter-

mined value relative to the comparison signal, whereupon the output circuit carries an output signal. The signal monitoring circuit includes an improvement for positively actuating the bistable circuit from the first condition to the second condition so that the output signal is characterized by substantially continuously varying from a first level to a second level,



wherein the improvement comprises circuit means coupling the output circuit to the comparison signal developing means for varying the value of the comparison signal in dependence upon the value of the output signal so as to increase the actuation time required to place the bistable means in the second condition.

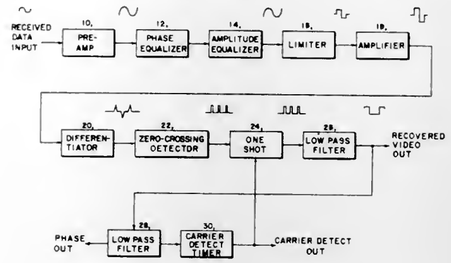
3,581,219
SYSTEM FOR DYNAMICALLY ADJUSTING CLIPPING IN EDITING ELECTROCARDIOGRAM WAVES
David C. Alexander, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 24, 1967, Ser. No. 677,685
Int. Cl. H03k *5/08*
U.S. Cl. 328—168 **4 Claims**



The disclosure sets forth a feedback system for dynamically adjusting the clipping levels in electrocardiogram analyses. The input-analog data is used to control the sampling rate in such a manner that only enough samples, including all significant deviations, are taken to describe the wave adequately. This makes it unnecessary to take a very large number of samples on a noisy record while it avoids missing important points.

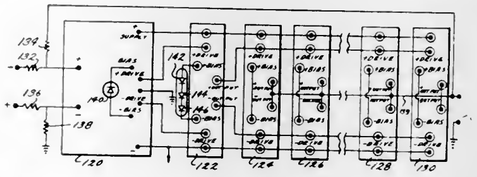
3,581,220
FREQUENCY MODULATION SIGNAL DEMODULATOR
Allan J. Bell, 18 Old Post Road, Fairport, N.Y., and Roger B. Stone, 4207 Marble Lane, Fairfax, Va.
Filed Feb. 17, 1969, Ser. No. 799,855
Int. Cl. H04l *27/14*
U.S. Cl. 329—126 **8 Claims**

In a data communication system a demodulator for use in detecting data information carried in a frequency modulated signal. A signal which had been modulated between upper and lower limits of frequency, in addition to other frequencies within or without the said limits for supervisory functions, would be received and by means of equalizers, a limiter, zero crossing detector, Schmitt trigger, and a low pass filter, the original data can be recovered from the received frequency modulated signal. Further, circuits are provided for providing phasing information and for detecting



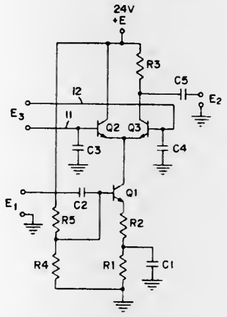
the presence or absence of the received carrier frequency signal.

3,581,221
FLEXIBLE AMPLIFICATION SYSTEM
Edward J. Martin, Jr., 219 Ferguson Ave., Newport News, Va.
Filed Apr. 29, 1968, Ser. No. 724,974
Int. Cl. H03f *3/16, 3/18*
U.S. Cl. 330—24 **10 Claims**



A flexible and expandable system comprising a number of modules from which a composite power amplifier of any given output capability can be constructed. An operational amplifier can be constructed from a driver module performing the voltage gain function and a number of booster modules connected to it furnishing the output power capability.

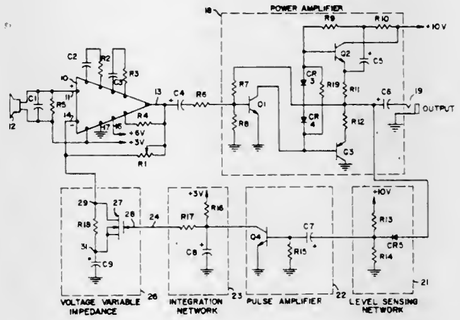
3,581,222
LINEAR VOLTAGE CONTROLLED ATTENUATOR
Duane E. Dunwoodie, Los Altos, Calif., assignor to Wilton Company, Palo Alto, Calif.
Filed Mar. 19, 1969, Ser. No. 808,471
Int. Cl. H03g *3/30*
U.S. Cl. 330—29 **8 Claims**



A voltage controlled attenuator for use in an automatic gain control circuit. The attenuator includes a first transistor having a relatively high output impedance driven by an AC input signal. Its collector output is coupled to the coupled

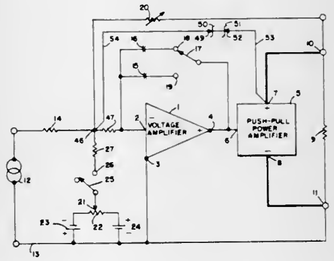
emitter inputs of two common base connected amplifiers which are differentially driven by a control signal to split the output current of the first transistor between them. The output voltage which is attenuated in proportion to the control signal is then taken from the collector of one of the common base amplifiers.

3,581,223
FAST RESPONSE DYNAMIC GAIN CONTROL CIRCUIT
Merritt S. Armstrong, San Francisco, Calif., assignor to HC Electronics, Inc., Tiburon, Calif.
Filed Apr. 30, 1969, Ser. No. 820,542
Int. Cl. H03g *3/30*
U.S. Cl. 330—29 **4 Claims**



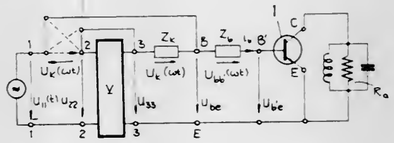
A dynamic gain control circuit for audio frequencies includes an audio amplifier of the operational type having an inverse feedback network including a threshold level sensing network providing a control voltage when the amplified output signal exceeds a predetermined level. The control voltage is coupled to the input of an insulated gate field effect transistor whose impedance is varied to control the amplification of the operational amplifier.

3,581,224
BIPOLAR OPERATIONAL POWER SUPPLY
Sarkis Nercessian, Long Island City, N.Y., assignor to Forbro Design Corp., New York, N.Y.
Filed Dec. 30, 1968, Ser. No. 796,262
Int. Cl. H03f *1/34*
U.S. Cl. 330—99 **7 Claims**



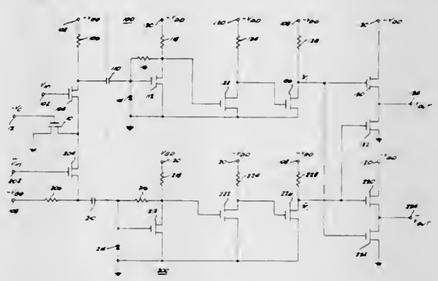
A bipolar operational power supply is constructed to provide stable operation over a wide range of gain settings including zero and with various load conditions in order to provide power output with AC or DC control or combinations of the two and in either voltage or current modes.

3,581,225
TRANSISTORIZED POWER AMPLIFIER
Horst Rothe, Geigersbergstrasse 17, 7500 Karlsruhe-Durlach, Germany
Filed Oct. 3, 1968, Ser. No. 764,755
Claims priority, application Germany, Oct. 4, 1967, P 15 37 653.1
Int. Cl. H03f *1/08*
U.S. Cl. 330—28 **8 Claims**



A transistor power amplifier whose high frequency power conversion efficiency is improved by the application of an input alternating control voltage whose waveform is adjusted to compensate for the voltage drops due to current flow between the transistor base-emitter junction and both the base terminal and the collector terminal of the transistor so as to impart the desired waveform to the output current at the transistor collector terminal.

3,581,226
DIFFERENTIAL AMPLIFIER CIRCUIT USING FIELD EFFECT TRANSISTORS
Carroll R. Perkins, Balboa Island; Everett L. Shaffstall, Fountain Valley; James L. Gundersen, Wilmington, and Robert N. Yoder, Huntington Beach, all of, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Dec. 22, 1969, Ser. No. 886,924
Int. Cl. H03f *3/68*
U.S. Cl. 330—30 **4 Claims**

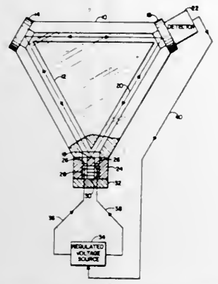


Complementary waveform signals are amplified in respective channels of a dual channel differential amplifier, each channel including a plurality of cascaded field effect transistors. A field effect transistor biased to saturation furnishes an essentially constant current to the first transistor of each channel. A push-pull arrangement including a pair of series connected field effect transistors is provided at the output of each channel. The entire circuit may be fabricated on a single semiconductor substrate using MOS technology.

3,581,227
ADJUSTABLE, THIN MEMBRANE MIRROR FOR USE IN THE STABILIZATION OF RING LASERS
Theodore J. Podgorski, Maplewood, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Apr. 18, 1968, Ser. No. 722,227
Int. Cl. H01s *3/08*
U.S. Cl. 331—94.5 **1 Claim**

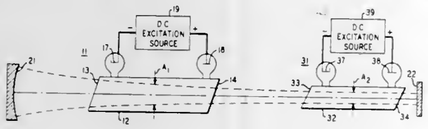
Apparatus to remotely move a mirror in a laser. The driv-

ing means operates against a thin membrane forming a por-



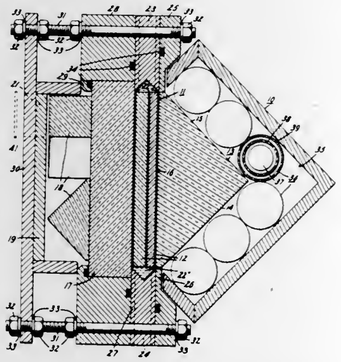
tion of the laser housing so that a mirror fastened to the inside of the membrane may be moved as desired.

3,581,228
SIMULTANEOUS TRANSVERSE AND LONGITUDINAL MODE LOCKING IN A LASER EMPLOYING AN ACTIVE ABSORPTION CELL
Peter W. Smith, Little Silver, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed June 18, 1968, Ser. No. 737,881
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **8 Claims**



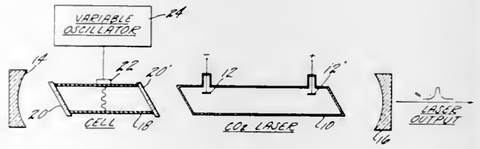
A laser that oscillates in multiple transverse and longitudinal modes is pulsed by a mutual adaptation of an absorption cell having a substantially matching absorption line and the other components of the laser to phase-lock simultaneously the traverse and longitudinal modes of the laser by saturable absorption. Simultaneous locking is accomplished provided that the laser resonator is designed such that the longitudinal mode separation frequency is an integral multiple of the transverse mode separation frequency.

3,581,229
FACE-PUMPED LASER DEVICE WITH OPTICAL PATH FOLDING
William S. Martin, Schenectady, N.Y., assignor to General Electric Company
Filed Aug. 27, 1968, Ser. No. 755,653
Int. Cl. H01s *3/00*
U.S. Cl. 331—94.5 **10 Claims**



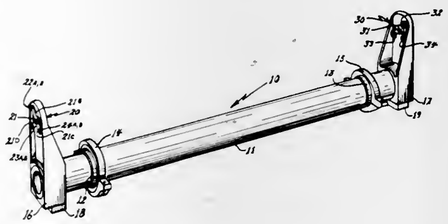
A face-pumped laser device employs a prism with an index of refraction at least equal to the square root of two adjacent and optically contacted to the surface of the active laser medium. The prism provides for refraction and total internal reflection of the pumping radiation which is directed to and is substantially uniformly incident upon the surface of the active laser medium, thus increasing the pumping flux density by the square root of two over conventional techniques. A plurality of prisms positioned on the opposite side of the laser medium are utilized in conjunction with the first mentioned prism to fold the optical path in such a manner that a generated or input laser beam may be made to penetrate a different region of the laser medium on each pass.

3,581,230
PASSIVE Q-SWITCH AND MODULATOR FOR CO2 LASERS
David C. Smith, Glastonbury, Conn., assignor to United Aircraft Corporation, East Hartford, Conn.
Filed Jan. 27, 1969, Ser. No. 793,945
Int. Cl. H01s *3/10, 3/22, 3/11*
U.S. Cl. 331—94.5 **5 Claims**



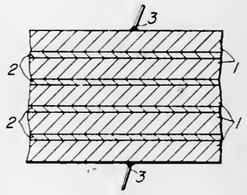
A cell containing a gaseous bleachable dye is positioned in the optical feedback cavity of a carbon dioxide laser to Q-switch the laser. An acoustic wave generated through the gas will cause the output of the laser to be modulated at the acoustic frequency.

3,581,231
ULTRA-STABLE LASER CAVITY MIRROR SUPPORT ASSEMBLY
Robert J. Freiberg, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force
Filed June 17, 1969, Ser. No. 833,907
Int. Cl. H01s *3/02;* **F16h** *29/20*
U.S. Cl. 331—94.5 **2 Claims**



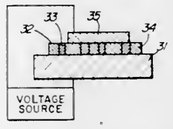
An ultrastable laser cavity mirror support assembly, for use with laser utilizing external mirrors, which prevents laser output loss caused by mirror misalignment. The assembly includes: a beryllium open-ended tube; two circumferential supports for the tube, each located a predetermined equal distance inward from the nearest end of the tube; first and second counterweighted flat plates affixed, respectively, to each end of the tube and parallel to each other; first and second mirror tuning mechanisms, each mounted on and supported by, respectively, the first and second counterweighted flat plates; and means for rigidly securing the tube, and components mounted and affixed thereto, to a laser housing and an external abutment in the desired orientation.

3,581,232
TUNABLE SEMICONDUCTOR BULK NEGATIVE RESISTANCE MICROWAVE OSCILLATOR
Yoshimasa Murayama, and Hirokazu Kurono, both of Hachioji-shi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed June 27, 1968, Ser. No. 740,635
Claims priority, application Japan, July 14, 1967, 42/45061
Int. Cl. H03b *7/14*
U.S. Cl. 331—107 **8 Claims**



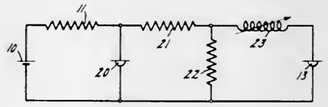
A solid-state oscillator comprising a semiconductor element which has a bulk negative resistance and wherein injected excess carriers are present in operation, said device oscillating with a circuit frequency of a resonator as the space charge limiting current due to the injected carriers becomes unstable owing to the negative resistance.

3,581,233
SOLID-STATE OSCILLATOR ELEMENT
Akio Yamashita, Ikeda-shi, and Takehiro Tuzaki, Toyonaka-shi, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Continuation-in-part of application Ser. No. 651,278, July 5, 1967, now abandoned. This application Aug. 5, 1969, Ser. No. 847,684
Int. Cl. H03b *7/14*
U.S. Cl. 331—107 **5 Claims**



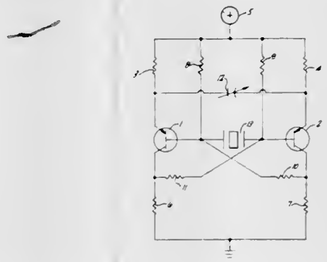
A solid-state oscillator element formed of a thin film of a polycrystalline semiconductor of which the minimum value of the conduction band represents a different energy level depending upon the direction in the wave vector space (usually referred to as "k-space"). Thus, the solid-state oscillator element is capable of producing a microwave oscillation.

3,581,234
BIAS AND TEMPERATURE COMPENSATING CIRCUIT FOR TUNNEL DIODE OSCILLATORS
Milton D. Bloomer, Scotia, N.Y., assignor to General Electric Company
Filed Dec. 10, 1969, Ser. No. 883,750
Int. Cl. H03b *7/08*
U.S. Cl. 331—107T **9 Claims**



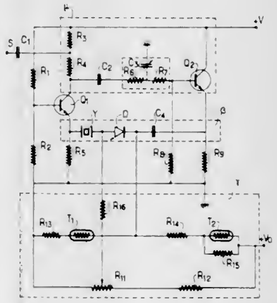
A compensation technique for tunnel diode oscillators is disclosed wherein the peaks in the characteristic curves (frequency vs. bias) for various operating temperatures are made to coincide in the region of the peak. The effects of bias and temperature are separately compensated and two techniques are disclosed for compensating each.

3,581,235
CRYSTAL STABILIZED HIGH FREQUENCY TRANSISTOR MULTIVIBRATOR
Paul Y. Siu, Los Angeles, Calif., assignor to Burroughs Corporation, Detroit, Mich.
Filed Feb. 19, 1969, Ser. No. 800,411
Int. Cl. H03b *5/36;* **H03k** *3/282*
U.S. Cl. 331—113 **10 Claims**



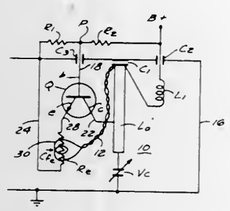
An astable multivibrator operating in a current mode comprising two transistors with resistive cross-coupling between each collector and the other base and capacitive cross-coupling between emitters. The natural frequency of the multivibrator is determined by the emitter resistors and the cross-coupling capacitance, which is preferably adjustable. A crystal having a parallel resonant overtone mode at the desired frequency of operation of the oscillator is connected between the bases of the transistors. The cross-coupling capacitance is adjusted so that the natural frequency of the multivibrator is slightly higher than the resonant frequency of the crystal.

3,581,236
HIGH STABILITY OSCILLATOR
Leon Berman, Asnieres, France, assignor to C.I.T. Compagnie, Industrielle Des Telecommunications, Paris, France
Filed Jan. 7, 1969, Ser. No. 789,540
Claims priority, application France, Jan. 8, 1968, 135,225
Int. Cl. H03b *5/36*
U.S. Cl. 331—116 **5 Claims**



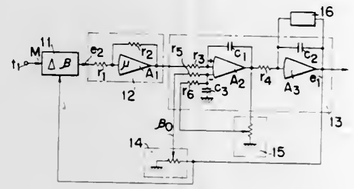
A high stability oscillator having an amplifying channel including a phase adjusting member and a separate reaction channel including a resonant crystal and a temperature stabilizing circuit, the phase adjusting member being effective to compensate for aging of the crystal without affecting the temperature stabilization of the oscillator.

3,581,237
OSCILLATOR FEEDBACK CIRCUIT FOR USE IN UHF TUNER
Masaharu Nakagawa, Tokyo, Japan, assignor to Alps Electric Company Limited, Tokyo, Japan
Filed Dec. 26, 1968, Ser. No. 787,112
Claims priority, application Japan, Mar. 28, 1968, 43/25002
Int. Cl. H03b *5/18*
U.S. Cl. 331—117D **10 Claims**



An RF oscillator circuit comprises a capacitance in a feedback circuit connected between the output and input terminals of an amplifier. That capacitance is defined by a pair of overlying conductors respectively operatively connected to the amplifier input and output terminals.

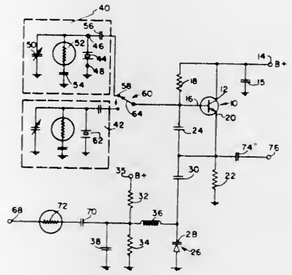
3,581,238
TRANSMISSION TRANSDUCER FOR REMOTE MEASUREMENT
Etsujiro Shimemura, Tokyo, and Masao Iwamiya, Yokohama-shi, both of, Japan, assignors to Ltd. The Tsurumi-Seikikosakv-Sho Co., Yokohama-shi, Japan
Filed Sept. 30, 1968, Ser. No. 763,782
Claims priority, application Japan, Sept. 30, 1967, 42/62756
Int. Cl. H03b *5/20*
U.S. Cl. 331—135 **7 Claims**



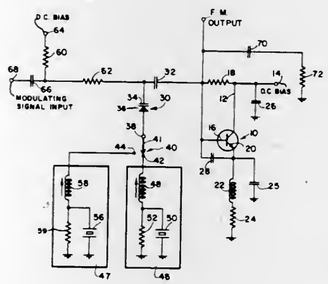
A transmission transducer for remote measurement is incorporated in the feedback loop of a double integrator type oscillator. The transducer is adapted to control the frequency of the oscillator corresponding to variations of gains of the transducer. The transducer gain is varied in accordance with variations of measured values which are directly sensed by the transducer.

3,581,239
FREQUENCY MODULATED CRYSTAL CONTROLLED OSCILLATOR OPERABLE AT A PLURALITY OF TEMPERATURE COMPENSATED CENTER FREQUENCIES
William J. Knutson, Chicago, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Mar. 5, 1969, Ser. No. 804,496
Int. Cl. H03b *5/32;* **H03c** *3/20, 3/28*
U.S. Cl. 332—18 **6 Claims**

A frequency modulated, solid state, crystal controlled oscillator, including a voltage variable capacitor, for use in portable transmitters wherein it is desired to operate at a plurality of center frequencies that are stable with temperature change. Any one of a plurality of center frequency determining circuits, each including a crystal operating in its parallel resonant mode, can be selected to determine a desired center frequency. Each crystal is connected in parallel with a temperature compensating network. The biasing point of the voltage variable capacitor, the net inductance of a circuit which applies the modulating voltage thereto are selected to cause the nonlinear characteristics of the crystal and voltage variable capacitor to counterbalance each other so that linear modulation is attained.



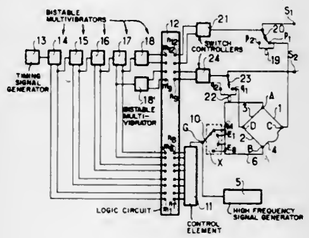
3,581,240
FREQUENCY MODULATED SOLID STATE CRYSTAL OSCILLATOR PROVIDING A PLURALITY OF CENTER FREQUENCIES
Ralph T. Enderby, Bellwood, Ill., assignor to Motorola, Inc., Franklin Park, Ill.
Filed Jan. 13, 1969, Ser. No. 790,726
Int. Cl. H03c *3/28*
U.S. Cl. 332—26 **8 Claims**



Frequency modulated, solid state oscillator which oscillates at any one of a plurality of center frequencies in response to the positioning of a selector switch that connects a selected center frequency determining circuit to the oscillator. Each of the center frequency determining circuits includes a crystal operating in its series resonant mode, an inductor for tuning, and a resistor for suppressing undesirable crystal operation. Frequency modulation is accomplished by impressing a modulating voltage across a varactor included in the frequency control circuit of the oscillator to thereby

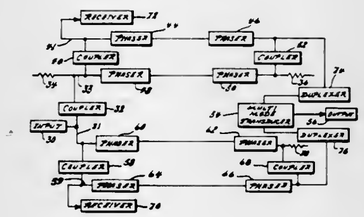
change its capacitance and consequently change the frequency of oscillation.

3,581,241
SIDEBAND GENERATOR HAVING STEP CONTROLLED MODULATION
Michel Schilliger, 31, rue des Oiseaux 91, Morangis, France
Filed May 24, 1968, Ser. No. 731,868
Claims priority, application France, May 24, 1967, 107,704
Int. Cl. H03c *1/54*
U.S. Cl. 332—47 **9 Claims**



A sideband generator, comprising a high frequency signal generator of frequency f_o, a circuit for generating low frequency signals of frequency $F_0=1/T$, characterized in that it comprises a bridge with two inputs and two outputs forming the sum and/or the difference of the signals fed to the inputs, the two inputs of said bridge being connected to the source of high frequency energy by means of numerically controlled distributing and phase-shifting means.

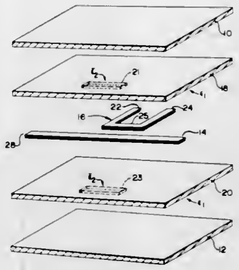
3,581,242
VARIABLE POLARIZER FOR MICROWAVE SYSTEMS
Louis J. Lavedan, Clearwater, Fla., assignor to the United States of America as represented by the Secretary of the Air Force
Filed Oct. 20, 1969, Ser. No. 867,619
Int. Cl. H01p *5/12, 1/16;* **H03h** *7/36*
U.S. Cl. 333—1 **1 Claim**



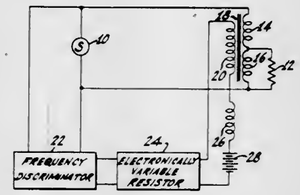
A dual-channel receiver polarizer microwave system including a pair of waveguide systems each having adjustable phasers mounted in parallel and in series and connected to a source of input signals and a multimode transducer for transmitting and the transducer and a receiver for receiving.

3,581,243
DIRECTIONAL COUPLER WHEREIN DIELECTRIC MEDIA SURROUNDING MAIN LINE IS DIFFERENT FROM DIELECTRIC MEDIA SURROUNDING COUPLED LINE
Andrew Alford, 71 Bacon St., Winchester, Mass.
Filed Mar. 21, 1969, Ser. No. 809,213
Int. Cl. H01p *5/14, 3/08*
U.S. Cl. 333—10 **7 Claims**

In a transmission line device for coupling a wave traveling in a particular direction along a main line to a coupled line, higher directivity is obtained by utilizing dielectric media of dissimilar dielectric constants in the main line and the coupled line, or by changing the relative propagation velocity along the main line with respect to the propagation velocity along the coupled line.



3,581,244
AUTOMATIC IMPEDANCE MATCHING CIRCUITS FOR VARIABLE FREQUENCY SOURCE
William Irving Smith, Palmyra, N.J., assignor to RCA Corporation
Filed Jan. 28, 1969, Ser. No. 794,665
Int. Cl. H03h *7/40*
U.S. Cl. 333—17 **3 Claims**



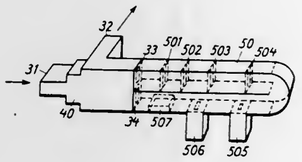
An electronically controlled impedance transformer is disclosed in which a tapped inductor is used as the impedance matching coupling means between the source and the load, and in which the inductance of the inductor is changed in accordance with the change of frequency of the current supplied by the source to preserve the impedance match. The coupling means may be tuned and the tuning may be made to track with the change in frequency of the source while the impedance match is substantially preserved, for both high and low Q circuits.

3,581,245
MICROWAVE ABSORBER FOR WAVEGUIDE TERMINATION
Kunio Ohi, Fuchu-shi; Hideaki Inoue, Tokyo; Toshio Nakayama, Tachikawa-shi, and Sosuke Ishii, Kokubunji-shi, all of, Japan, assignors to Hitachi Electronics Co., Ltd., Kodaira-shi, Japan
Filed Sept. 27, 1968, Ser. No. 763,255
Int. Cl. H01p *1/26*
U.S. Cl. 333—22 **6 Claims**

A microwave terminator having a microwave absorber in the form of a plate which is fixed bodily to a shortcircuiting

plate of metal disposed at a right angle with the axis of a waveguide. The microwave absorber is made from a composition consisting of a powdery ferromagnetic material, carbon powder and a binder therefor, and is shaped to have a stepwise or continuously varied thickness distribution.

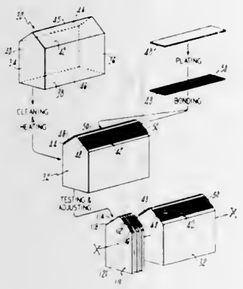
3,581,246
FILTER ARRANGEMENT
Tore Torstensson Fjallbrant, Staborg, Fjaras, Sweden, assignor to Telefonaktiebolaget L. M. Ericsson, Stockholm, Sweden
Filed Nov. 7, 1967, Ser. No. 681,223
Claims priority, application Sweden, Dec. 7, 1966, 16,806/1966
Int. Cl. H03h *13/00;* **H01p** *5/12*
U.S. Cl. 333—24.1 **5 Claims**



There is disclosed a filter comprising a power dividing circuit means including an input port adapted to receive signals, an output port adapted to transmit signals and two signal-transfer ports. Signals received by the input port are power divided and fed to the signal-transfer ports for transmission therefrom to a reactive circuit means which reflects the signals back to the signal-transfer ports. The reflected signals received by the signal-transfer ports pass through the power dividing circuit means to the output port and are geometrically added.

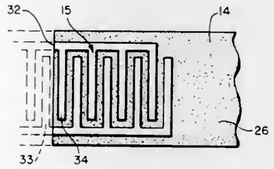
Various power dividing circuit means including differential transformers, magic T devices and 90° hybrid devices are disclosed. The reactive circuit means include, reciprocal and nonreciprocal phase shifters as well as waveguide elements having irises and tuning stubs.

3,581,247
DELAY LINES HAVING NONDISPERSIVE WIDTH-SHEAR MODE PROPAGATION CHARACTERISTICS AND METHOD OF MAKING SAME
John F. Belford, Westport; Donald E. Gibeau, Hazardville, and John Ciriello, Canton, all of, Conn., assignors to Andersen Laboratories, Incorporated, Bloomfield, Conn.
Continuation-in-part of application Ser. No. 736,675, June 13, 1968. This application Sept. 27, 1968, Ser. No. 763,199
Int. Cl. H03h *9/16, 9/30*
U.S. Cl. 333—30 **9 Claims**



Thin guided waveform delay lines of this invention feature a maximum thickness in the order of two ½ wavelengths with full width transducers coextensive with the delay line thickness providing nondispersive width-shear mode propagation characteristics. A low cost mass production method of making a substantially identical series of such delay lines if also disclosed including steps of forming a composite preshaped block of acoustically conductive material with signal transducers affixed thereto and then cutting the composite block with its signal transducers into a plurality of substantially identical delay line segments. Completed delay line segments each can be housed in a casing having associated electrical circuit components of each delay line segment.

3,581,248
ACOUSTIC FILTERS
Adrian J. De Vries, Elmhurst, and Thomas J. Wojcik, Mount Prospect, both of, Ill., assignors to Zenith Radio Corporation, Chicago, Ill.
Filed Mar. 26, 1969, Ser. No. 810,774
Int. Cl. H04r *17/10;* **H01v** *7/00*
U.S. Cl. 333—72 **1 Claim**

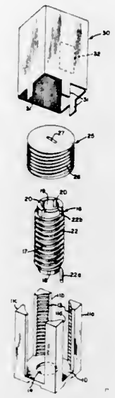


A body of piezoelectric material propagates acoustic surface waves. Coupled to a surface of the body is a first transducer that launches the waves. Spaced on the same surface from the first device is a second transducer that responds to the launched waves. In order to reduce interference from reflections and increase efficiency, an end surface of the body is selectively located with respect to the adjacent transducer and is formed to define a particular angle with respect to the wave propagating surface. With the transducer elements in the form of interleaved combs of electrodes, absorption of reflections from an end surface is increased by effectively locating the end surface a precise fraction of an acoustic wavelength from the nearest comb electrode or tooth. Moreover, the response of the combined apparatus to signals being transmitted may be altered by changing either the angle that the end surface forms with respect to the propagating surface or by changing the spacing of the end surface from the transducer. The response also may be altered by depositing a different material on the wave propagating surface.

3,581,249
MINIATURE HELICAL RESONATORS
Frederick E. Spangler, and Henry A. Schaefer, both of Lynchburg, Va., assignors to General Electric Company
Filed Jan. 27, 1969, Ser. No. 794,332
Int. Cl. H03h *1/00, 5/08*
U.S. Cl. 333—705 **7 Claims**

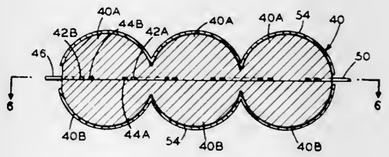
A helical coil resonator is wound on a dielectric form mounted on a dielectric base. Four posts are mounted on the base at the corners of a square, and are threaded on their inner faces to form a threaded receptacle that is concentric about the coil. A cup-shaped dielectric tuning element is threaded in the receptacle for movement toward and away

from the coil, and a metallic can is positioned around the posts. The capacity between the coil and can, and hence the



resonant frequency of the resonator, is varied by adjusting the position of the tuning element relative to the coil.

3,581,250
DELAY LINE HAVING NON PLANAR GROUND PLANE, EACH LOOP BRACKETING TWO RUNS OF MEANDERING SIGNAL LINE
Edwin S. Eichert, Bryn Mawr, and William T. Storey, II, West Chester, both of, Pa., assignors to Technitrol, Inc., Philadelphia, Pa.
Filed Apr. 12, 1968, Ser. No. 720,998
Int. Cl. H01p *5/12, 3/02, 3/08*
U.S. Cl. 333—31 **9 Claims**



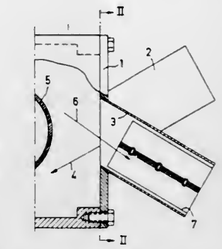
An electrical component such as a delay line comprising a first signal conductor and a second signal conductor spatially displaced from and electrically cooperable with said first signal conductor. At least one of said first or second signal conductors extending through an enclosure of nonconductive material having nonplanar upper and lower surfaces to provide increased isolation between an input and an output signal.

A method of making the electrical component also is disclosed.

3,581,251
MICROWAVE TUBE COOLING ASSEMBLY
Friedrich Potzl, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 28, 1969, Ser. No. 803,256
Claims priority, application Germany, Mar. 8, 1968, P44196
Int. Cl. H01p *1/16, 7/06*
U.S. Cl. 333—83 **7 Claims**

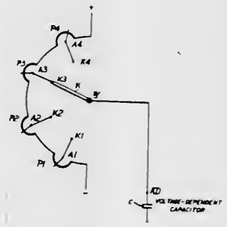
The invention relates to a connecting flange for a microwave tube arranged in an external resonator space, the connecting flange having two tubular pieces for the inlet and the outlet of the cooling air.

The air enters the resonator space in oblique direction, flows around the microwave tube along an approximately α-shaped path, and emerges from the other slanting tubular piece. Axial metal plates in the tubular pieces form an ex-



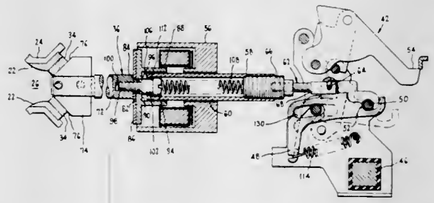
tremely low resistance to the flow of cooling air while exhibiting very high damping for the resonator waves.

3,581,252
POTENTIOMETER CIRCUIT ARRANGEMENT FOR DERIVING A TUNING VOLTAGE
Franz Sacher, Vienna, Austria, assignor to Wiener Schwachstromwerke Gesellschaft m.b.H., Vienna, Austria
Filed Sept. 23, 1968, Ser. No. 761,482
Claims priority, application Austria, Feb. 22, 1968, A1,675/68
Int. Cl. H03j *5/02, 3/18*
U.S. Cl. 334—15 **6 Claims**



A circuit arrangement for deriving a tuning voltage for controlling a tuning capacitance includes a plurality of potentiometers connected to form a voltage divider, each having a resistance path and a tap. The tap is electrically connected to the resistance path, and the resistance paths are connected in series. A selector switch comprises a plurality of contacts, each connected to a respective one of the taps, and a contact arm selectively engageable with the contacts. Each potentiometer corresponds to a respective frequency range, such as a channel or a group of channels.

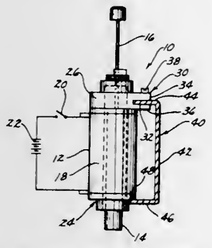
3,581,253
ARMATURE-CONTACT ROD CONNECTION FOR CURRENT-LIMITING BREAKER
Norman R. Beaudoin, Bristol, and Robert W. Lauben, Farmington, both of, Colo., assignors to General Electric Company
Filed Oct. 15, 1969, Ser. No. 866,533
Int. Cl. H01h *77/10*
U.S. Cl. 335—16 **9 Claims**



A current-limiting circuit breaker is provided with a new and improved contact-operating assembly having a contact

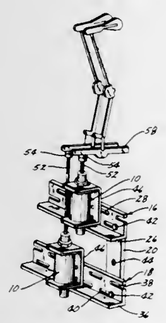
rod operatively joined to a tubular operating shaft by an axially extending stepped connector fixedly received within the rod and slidably retained by the operating shaft to permit limited relative movement between the operating shaft and the contact rod of the assembly. A spring mounted within the tubular shaft acts on the connector and may be adjusted independently of shaft movement.

3,581,254
ADJUSTABLY MOUNTED PLAYER PIANO KEY ACTUATING ASSEMBLY
Richard L. Cannon, and Leonard R. D. Smith, both of Yankton, S. Dak., assignors to Dale Electronics, Inc., Columbus, Nebr.
Filed June 13, 1969, Ser. No. 833,066
Int. Cl. H01t *7/08*
U.S. Cl. 335—255 **10 Claims**



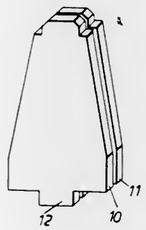
An assembly for actuating piano playing means which includes means for mounting solenoid key actuating units on a metallic channel means. The solenoid units include a laterally extending tab having a groove formed therein which is adapted to receive one flange of the channel means. A screw member extends through the tab and engages the flange to maintain the solenoid unit on the channel means. The units may be arranged in a side-by-side relationship on one channel means or may be arranged on oppositely disposed channels. The units may also be staggered on vertically spaced channels. The metal-to-metal connection between the solenoid units and the channel means permits the channels to serve as a common magnetic path for the individual coils and as a heat sink to dissipate heat directly from the coils. An embodiment of the assembly is also disclosed wherein the solenoid has a tab extending therefrom and which is removably received between a pair of flanges extending from the channel means.

3,581,255
MOUNTING MEANS FOR PLAYER PIANO KEY ACTUATING ASSEMBLY
Richard L. Cannon, and Leonard R. D. Smith, Yankton, both of, S. Dak., assignors to Dale Electronics, Inc., Columbus, Nebr.
Continuation-in-part of Ser. No. 833,066, June 13, 1969
Filed June 24, 1970, Ser. No. 49,349
Int. Cl. H01t *7/08*
U.S. Cl. 335—255 **7 Claims**



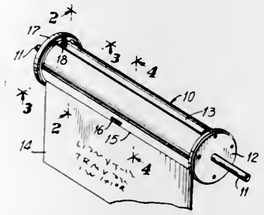
An assembly for actuating piano playing means which includes means for mounting solenoid key actuating units on a metallic support means. The support means includes a pair of spaced apart elongated angle members. Each of the angle members have upper and lower rows of horizontal slots formed therein which are staggered with respect to each other to permit the selective mounting of the solenoid units thereon. Each of the solenoid units have a frame means thereon which may be secured to the angle members by means of screws or the like extending through the slots in the angle members and being threadably received by the frame means.

3,581,256
SHOCK RESISTANT ARMATURE FOR ELECTROMAGNETIC DEVICES
Charles Vazquez, Paris, France, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Mar. 21, 1969, Ser. No. 809,270
Claims priority, application France, Mar. 28, 1968, 145,857
Int. Cl. H01f *7/08*
U.S. Cl. 335—271 **5 Claims**



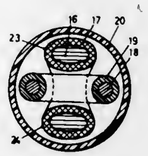
Structure for damping the vibrations in armatures of electromagnets. The shock of operating pieces in electromechanical devices is reduced by making the armature out of several parts. These parts are juxtaposed, but they are not rigidly associated with each other. Each part vibrates at a frequency proper to it. This arrangement enables a great damping of the overall vibration resulting from shocks.

3,581,257
MAGNETIC HOLDING DRUM
Edmund F. Priessnetz, Baldwin, N.Y., assignor to Electronic Transmission Systems, Inc., New York, N.Y.
Filed Oct. 29, 1969, Ser. No. 872,238
Int. Cl. H01f *7/20*
U.S. Cl. 335—285 **7 Claims**



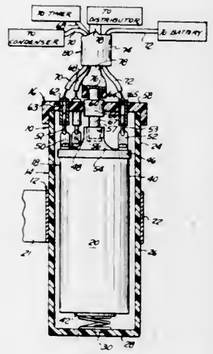
A magnetic holding drum particularly suitable for optical reproduction devices such as facsimile transmitters, which enables the copy to be held substantially flat over the surface of the drum while the drum is either rotated or optically scanned. The drum includes a plurality of spaced-apart, radially disposed elongated magnets on its cylindrical surface. A sliding holder which is slidably retained in grooves at each end of the drum is magnetically affixed at any desired position on the surface of the drum in order to maintain the copy flattened against the drum's surface.

3,581,258
ELECTROMAGNETIC WIRING SYSTEM OF INTERLINKED COILS PARTICULARLY SUITABLE IN A CURRENT TRANSFORMER FOR HIGH VOLTAGES
Friedrich Raupach, Messwandler-Bau GmbH, Nuernberger Strasse 199, D-86 Bamberg, Germany
Filed Feb. 13, 1969, Ser. No. 798,921
Int. Cl. H01f *40/06*
U.S. Cl. 336—173 **32 Claims**



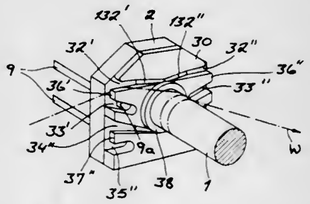
An electromagnetic energy transforming device particularly suitable in a current transformer for high voltages and similarly interlinked coils comprising at least one core; at least one coil threaded through said core; said core having a closed symmetrical geometrical *z–y* shape of a *z–y* longitudinal cross section with at least two core legs in parallel and at least one core bar interconnecting said legs; said core having a *x–y* symmetrical cross section perpendicular to the length of said core substantially elongated, with a longer "*x*" axis and a shorter "*y*" axis and a "*z*" axis perpendicular to said *x* and *y* axes; said at least one core bar being symmetrically gradually twisted relative to said core legs with the core "*x*" axis being parallel to the "*z*" core axis of said at least two core legs in the center of said core bar between said core legs; the surface of said core bar adjacent the surface of said coil bar being of a shape closely mating with said surface of said coil bar in three dimensions.

3,581,259
QUICKLY-REMOVABLE IGNITION COIL INSTALLATION FOR AUTOMOBILE THEFT PREVENTION
Ernest Brunside, 3843 Rohns Ave., Detroit, Mich.
Filed Nov. 19, 1969, Ser. No. 877,890
Int. Cl. H01f *27/02*
U.S. Cl. 336—90 **8 Claims**



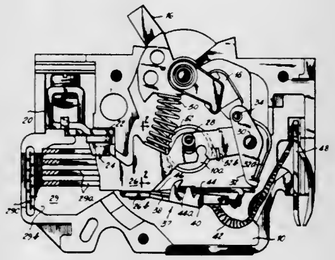
An ignition coil receptacle adapted to be mounted near an automobile engine has a removable cover containing first, second and third low-tension terminals and a single high-tension terminal detachable engageable respectively with first, second and third correspondingly located low-tension electrodes and a single high-tension electrode mounted in the end cap of an automobile ignition induction coil removably mounted in the receptacle. One end of the primary winding of the coil is connected as usual to one end of the secondary winding thereof and their common junction is connected to the first low-tension electrode which in turn is connected directly to the second low-tension electrode. The opposite end of the primary winding is connected to the third low-tension electrode whereas the opposite end of the secondary winding is connected to the single high-tension electrode. The first, second and third low-tension cover terminals are connected to first, second and third low-tension cables and the single high-tension cover terminal to a high-tension cable, all of these cables being contained within a flexible tubular casing. The first low-tension cable leads to a conventional timer, the opposite pole of which is grounded. The interconnected second low-tension cable is connected to one side of the conventional coil condenser, the opposite side of which is grounded to the engine. The third low-tension cable leads to one terminal of a conventional storage battery, the opposite terminal of which is grounded to the automobile frame. The single high-tension cable is connected to the rotor of the conventional distributor, the fixed poles of which are connected to the central electrode of the spark plug whose casings are grounded to the engine. Upon leaving the automobile, the driver pulls outward upon the receptacle cover, thereby withdrawing the coil and cover as a unit from the receptacle. He then pulls the cover terminals and coil electrodes apart from one another to separate them, replaces the cover upon the receptacle, and carries the ignition coil away with him, thereby preventing theft of the automobile.

3,581,260
FLANGE FOR ELECTROMAGNETIC COIL
Pio Andreis, Milan, Italy, assignor to Societa Italiana Telecommunicazioni Siemens S.P.A., Milan, Italy
Filed Oct. 13, 1969, Ser. No. 865,700
Claims priority, application Italy, Oct. 14, 1968, 22469
Int. Cl. H01f *15/10*
U.S. Cl. 336—192 **10 Claims**



A spool body for a relay coil is formed from a ferromagnetic core bounded by two nonconductive flange plates; at least one of these plates has a pair of notches, tangential to the core, for the ends of each winding to be wound thereon and a pair of depressions adjacent these notches on the outer plate surface remote from the core to receive these wire ends for soldering to respective terminals at locations sheltered from the coil winding or windings.

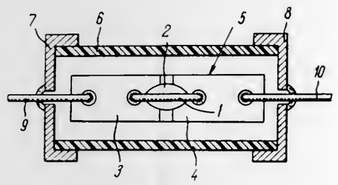
3,581,261
MOLDED CASE CIRCUIT BREAKER HAVING AN AUXILIARY CONTACT SEPARATING SPRING
John De Torre, and Henry S. Wingard, both of Albemarle, N.C., assignors to Federal Pacific Electric Company
Filed July 28, 1969, Ser. No. 845,275
Int. Cl. H01h *71/16, 71/64, 75/12*
U.S. Cl. 337—67 **3 Claims**



A circuit breaker of the molded case type incorporating a spring that accelerates movement of the movable contact to

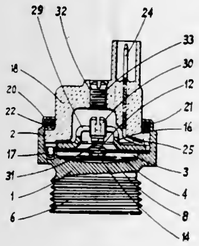
the open circuit position. The same spring augments contact pressure between the movable and stationary contacts in the closed circuit condition of the circuit breaker.

3,581,262
SAFETY FUSE WITH GLASS COATING ON FUSIBLE PORTION
Efim Yakovlevich Badinter, ulitsa Fedko, 8, kv. 79; Zinovy Ieremeevich Zelikovsky, ulitsa Pushkina, 35, kv. 13, and Irina Georgievna Lazurevskaya, ulitsa Gorkogo,221a., all of Kishinev, U.S.S.R.
Filed Mar. 6, 1969, Ser. No. 804,797
Int. Cl. H01h *85/14*
U.S. Cl. 337—159 **4 Claims**



A safety fuse provided with a fusible element adapted for protection against overloads, the surface of said fusible element being covered with a continuous glass insulation coating. The fusible element may be a length of a cast microwire provided with a glass insulation.

3,581,263
THERMALLY RESPONSIVE SWITCH
Antonio Moro, Milan, Italy, assignor to Soc. per Azioni Fratelli Borletti, Milan, Italy
Filed July 8, 1968, Ser. No. 743,157
Int. Cl. H01h *37/04, 37/28, 37/54*
U.S. Cl. 337—380 **12 Claims**

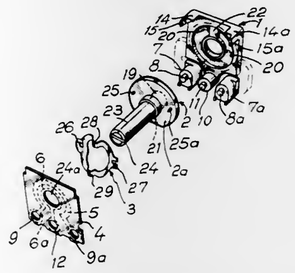


A thermally responsive switch comprising a housing including a metal body with a recess therein. A cap of insulating material is secured to the metal body closing the recess. A disc-shaped bimetallic strip is loosely housed in the recess. The fixed contact is carried by a stiff metal bridge which bridges across the recess. The position of the fixed contact is adjustable. Adjustment being made by a tool inserted through an aperture in the cap.

3,581,264
METHOD OF CREATING VARIABLE ELECTRICAL RESISTANCE AND MEANS FOR CREATING THE SAME
Herman R. Person, Columbus, Nebr., assignor to Dale Electronics, Inc., Columbus, Nebr.
Division of Ser. No. 593,998, Nov. 14, 1966, Pat. No. 3,480,832.
Filed Apr. 21, 1969, Ser. No. 817,965
Int. Cl. H01c *7/16*
U.S. Cl. 338—20 **3 Claims**

A variable magnetic resistor comprising a layer of high permeability magnetic alloy formed into a helix with a layer of insulation material in between each convolution of the helix, and an electrical terminal secured to opposite ends of the layer of alloy. The method of creating variable resistance by passing a current of sufficient magnitude through said alloy material that the current passing through the alloy will be forced to the side edges thereof by the magnetic field around each convolution of the helix, whereby the resistance of the alloy will be increased as current moves away from a normal low-voltage path through the broad expanse of the entire cross-sectional area of the coil to a more confined path at the side edges of the coil.

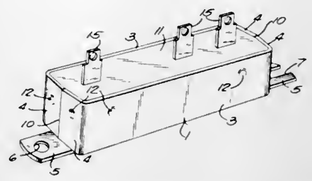
3,581,265
MINIATURIZED POTENTIOMETERS
Eugenio Falco, 13, Avenue Taille Bourg, Paris 110, France
Filed Feb. 24, 1969, Ser. No. 801,457
Claims priority, application France, Feb. 27, 1968, Dec. 3, 1968, 141.458;176.382
Int. Cl. H01c *9/02*
U.S. Cl. 338—174 **13 Claims**



A potentiometer having a cover of conductive material formed by molding in a single piece with a pair of lateral terminals provided to be placed at the ends of a resistance track, a collector, and a base on which the resistance track and the collector are printed. The lateral terminals are separated from the cover during the step of crimping the cover on the base.

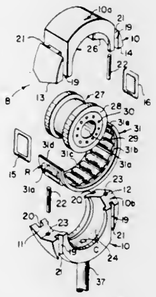
3,581,266
HOUSED RESISTOR
Lionel E. Weyenberg, N34 W23575 Capitol Drive Parkway, Pewaukee, Wis.
Filed Dec. 30, 1968, Ser. No. 787,806
Int. Cl. H01c *1/02*
U.S. Cl. 338—253 **5 Claims**

A potted resistor including an outer metal casing, and a resistance element is embedded within an insulating material contained within the casing. Terminal strips are connected to



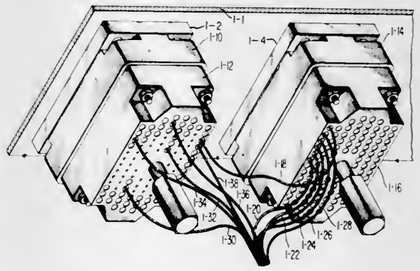
the resistance element and project outwardly of the insulating material in position to be connected to electrical leads.

3,581,267
ELECTRIC CONDUCTOR BEARINGS
Robert Z. Schreffler, Chester, Va., assignor to Electric Conductor Bearings, Incorporated, Chester, Va.
Continuation-in-part of application Ser. No. 562,956, June 30, 1966. This application Aug. 14, 1968, Ser. No. 752,666
Int. Cl. H01r *39/28*
U.S. Cl. 339—8 **10 Claims**



An electric conductor bearing arrangement includes a fixed outer race, a shaft-mounted rotatable inner race and a plurality of roller bearing devices for completing a current path therebetween. The bearing devices each include a cylindrical coil spring arranged with the longitudinal axis thereof parallel to the shaft axis. The spring bearings which are transversely compressible compensate for any misalignments by assuming a shape compatible with the existing alignment.

3,581,268
ELECTRICAL CONNECTION AND DISTRIBUTION SYSTEM
Harold Akst, West Chester, Pa., assignor to Burroughs Corporation, Detroit, Mich.
Filed Apr. 1, 1969, Ser. No. 812,185
Int. Cl. H01r *29/00*
U.S. Cl. 339—18 **5 Claims**

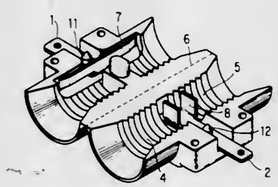


This invention discloses an electrical connection and distribution system including one or more unique distribution connectors. Each of sad distribution connectors is capable of distributing current or voltage to a plurality of wire connections from an individual connection. The connector shell envisioned, for use in this connector, is of a commercially available configuration. By including one or more unique jumper means in these commercially available connectors, a new and novel connector combination is created wherein a single wire enters a terminal one side of the connector and multiple wires leave corresponding multiple terminals on the same side to provide a distribution system for the current or voltage source which entered the single terminal.

3,581,269
CONNECTOR FOR COAXIAL CABLE
Dean R. Frey, Dover; George L. Hone, Berkeley Heights, and Edward L. Ramsey, Jr., Martinsville, all of, N.J., assignors to Bell Telephones Laboratories, Incorporated, Murray Hill, N.J.
Filed Mar. 11, 1969, Ser. No. 806,098
Int. Cl. H01r *17/04, 33/34*
U.S. Cl. 339—94 **4 Claims**

This disclosure describes a connector for a communications coaxial cable. The connector structure includes a collapsible bushing which is wedged into a positive grip with the cable jacket, and a separate wedge-type bushing to grip the outer conductor. A resilient seal is afforded around the center conductor. Placement of the cable in the connector and of the latter onto equipment housing requires no special tools.

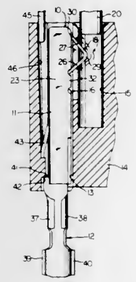
3,581,270
THERMOPLASTIC LAMP HOLDER
Larry L. Shroyer, Wolcottville, Ind., assignor to Lyall Electric, Inc., Albion, Ind.
Filed Apr. 4, 1969, Ser. No. 813,610
Int. Cl. H01r *13/48*
U.S. Cl. 339—160 **7 Claims**



A multiple lamp holder is disclosed which is characterized by its simplicity of construction. The lamp holder is made up

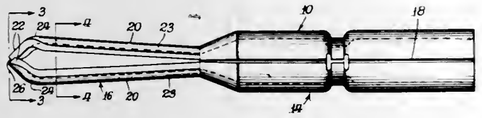
of four pieces: two conductive terminals, an insulating bushing which holds the two terminals apart and an insulating housing which is molded in a single piece and consists of two complementary halves of the housing joined together in a hinged relationship so that the two halves may be folded together so as to enclose the terminals and bushing and the resulting structure need only to be sealed along a single seam.

3,581,271
CONTACT UNIT HAVING CONTACT PROTECTIVE MEANS
Heinz Knitter, Heilbronn, and Josef Veszelik, Weinsberg, Germany, assignors to The Bunker-Kame Corporation, Oak Brook, Ill.
Filed May 7, 1969, Ser. No.
Int. Cl. H01r *13/42*
U.S. Cl. 339—176 **8 Claims**



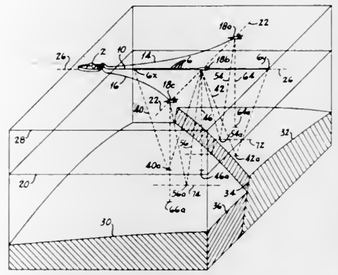
Contact unit adapted for insertion in an internal passage of a connector body and including a resilient spring metal contact engageable with a mating contact and substantially enveloped within a protective housing to prevent damage thereto. The housing, contact and terminal means are preferably integral with a metal body and formed from a one-piece sheet metal stamping.

3,581,272
MINIATURE CONNECTOR
Robert S. Yopp, Naperville, and Melvin G. Kraft, Bellwood, Ill., assignors to The Bunker-Romo Corporation, Oak Brook, Ill.
Filed Dec. 23, 1968, Ser. No. 786,189
Int. Cl. H01r *11/22*
U.S. Cl. 339—252 **5 Claims**



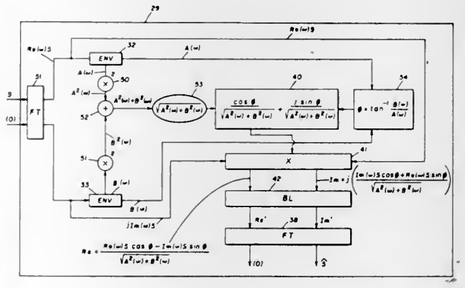
Pin contact, of a miniature connector, made as a stamping from a single piece, having a pair of cantilever contact elements together forming a pin member.

3,581,273
MARINE SEISMIC EXPLORATION
Ronald M. Hedberg, 18 Whittier St., Cambridge, Mass.
Continuation of application Ser. No. 645,643, June 13, 1967. This application Nov. 10, 1969, Ser. No. 875,510
Int. Cl. G01v *1/38*
U.S. Cl. 340—7PC **13 Claims**



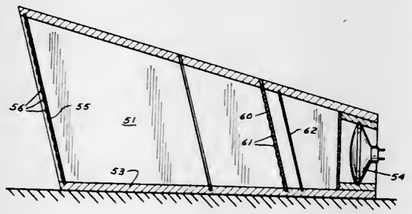
Continuous marine seismic explorations are carried out by providing echo detecting means with control means for maintaining the echo detecting means in fixed or predetermined positions and at spaced points in two dimensions of a horizontal plane, and by generating echo producing impulses at one or more spaced points located in fixed or predetermined relative positions with respect to each other and in said plane. In this way, a set of records may be obtained which define the seismic interfaces of the prospect under survey in two intersecting vertical planes. Thereafter, by producing successive sets of such records, quadratic surfaces in which the true inclinations of interfaces may be determined over an extended area are obtained in a single traverse thereof. At the same time, the accuracy of the records obtained is materially increased.

3,581,274
FREQUENCY-DOMAIN BAND BROADENING OF SEISMIC DATA
William H. Ruehle, Duncanville, Tex., assignor to Mobil Oil Corporation
Filed Mar. 19, 1969, Ser. No. 808,410
Int. Cl. G01v *1/00*
U.S. Cl. 340—15.5 **9 Claims**



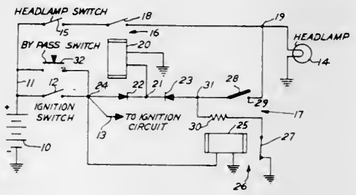
The specification, in the preferred embodiment, discloses a technique for removing distortion such as multiples from seismograms by converting the traces of the seismogram by Fourier transformation into their real and imaginary parts. The envelopes of the real and imaginary parts are detected in the frequency domain and operated on to produce inverse operators which are a function of the envelopes of the real and imaginary parts. The product is formed between the real and imaginary parts of the traces and the inverse operators to remove distortion components from the real and imaginary parts of each trace. The resulting distortion-free data is transformed back into the time domain for further processing and analysis.

3,581,275
MOIRE FRINGE PRODUCING DEVICE USED FOR INTERCEPTION COURSE INDICATION
Paul S. Petersen, Minnetonka, Minn., assignor to Rosemount Engineering Company, Minneapolis, Minn.
Filed Oct. 23, 1965, Ser. No. 503,652
Int. Cl. G08g *5/00;* **G64f** *1/20*
U.S. Cl. 340—25 **6 Claims**



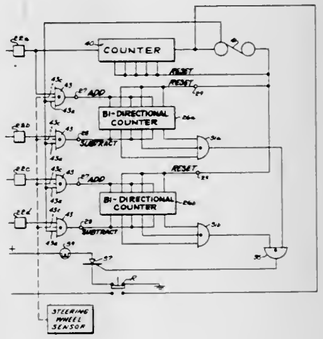
A landing aid utilizing the principle of Moire fringe patterns so that a plurality of wide light and dark bands are observed by a person using the landing aid, and when on proper course, the bands do not move, but when on other than an interception course, the bands appear to move, and such movement will be in relationship to the amount of error in the interception course.

3,581,276
VEHICLE LIGHT CONTROL AND WARNING INDICATOR SYSTEM
LaVerne R. Newman, St. Clair Shores, Mich., assignor to Essex International, Inc., Fort Wayne, Ind.
Filed Mar. 22, 1968, Ser. No. 715,314
Int. Cl. B60q *1/02*
U.S. Cl. 340—52 **16 Claims**



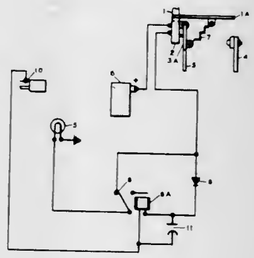
An automatic lamp disconnecting system for vehicle lighting systems having a lamp energizing circuit including a normally open relay switch in series with a manual lamp control switch. Magnetic means for closing the relay switch is energized through the vehicle ignition switch and through a separate holding circuit comprising, in series connection, the relay switch, the lamp control switch, and a normally closed thermal time delay switch which has a heating element responsive to energization of the vehicle lamp only when the ignition switch is opened to effect opening of said time delay switch a predetermined time after opening of the ignition switch.

3,581,277
TIRE INFLATION MONITORY SYSTEM
Robert D. Beatty, Jr., Gates Mills, and Thomas C. Griffiths, Chardon, both of, Ohio, assignors to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Oct. 20, 1967, Ser. No. 676,891
Int. Cl. B60c *23/00*
U.S. Cl. 340—58 **18 Claims**



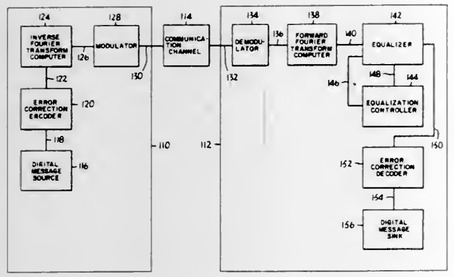
Angular movements of wheels or other objects rotating at the same surface speed are sensed as by counting revolutions of the wheels or objects with the angular movements of the wheels or objects being compared with each other or a reference to determine whether or not one wheel or object has a smaller diameter.

3,581,278
WARNING DEVICE FOR MOVING VEHICLE
Bobbie Dale Huffman, R.R.24, Box 163, Terre Haute, Ind.
Filed Sept. 23, 1968, Ser. No. 761,536
Int. Cl. B60q *1/50*
U.S. Cl. 340—62 **7 Claims**



A warning device for a self-propelled vehicle comprising an air-pressure sensitive device normally inactivated by motion of the vehicle against air but becoming activated during deceleration at a speed below a predetermined speed thereby signaling others of the deceleration. The device comprises an air pressure responsive means, a microswitch, and one or a multiple of warning lamps. In a preferred embodiment a manually controlled masking means is provided whereby said air-pressure responsive means can be shielded from air pressure by operator of said vehicle. In another embodiment the warning lamps are the turn signals normally present on a vehicle and a means is provided whereby activation of the turn signals by the turn-signal lever automatically inactivates the warning device.

3,581,279
SIGNAL TRANSMISSION METHOD AND SYSTEM
Timothy Arbuckle, Montclair, N.J., assignor to Computer Modem Corporation, Ft. Lee, N.J.
Filed June 9, 1969, Ser. No. 831,293
Int. Cl. G08c *25/00*; **H04b** *15/00*
U.S. Cl. 340—146.1 **14 Claims**



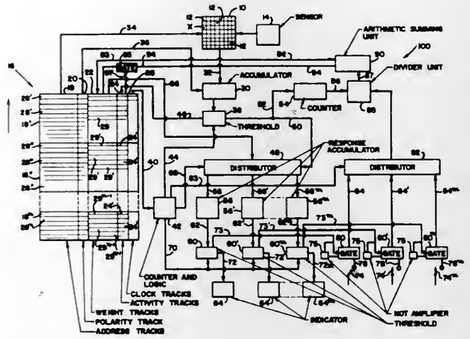
A signal transmission system enabling exchange of the information content of message signals with substantial reduction of communication channel noise effects thereof. Message signals are converted into other signals actually transmitted. Received signals are reconverted to provide said message signals, the conversion and reconversion being of such nature as to effect substantially uniform distribution of channel noise in message signals derived from said received signals.

3,581,280
HOLOGRAPHIC SPATIAL FILTERS AND METHOD OF MAKING SAME
John M. Holeman, Schenectady, N.Y., assignor to General Electric Company
Filed June 27, 1966, Ser. No. 560,418
Int. Cl. G06k *9/00*
U.S. Cl. 340—146.3F **9 Claims**

This invention relates to holography, and more particularly to a method and apparatus for rapidly making highly efficient spatial filters for holography.

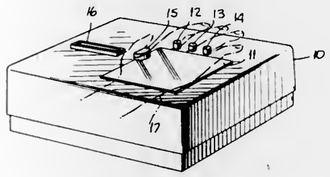
3,581,281
PATTERN RECOGNITION COMPUTER
Francis C. Martin, Williamsville, N.Y., and James P. Nicklas, Woodland Hills, Calif., assignors to Cornell Aeronautical Laboratory, Inc., Buffalo, N.Y.
Filed Mar. 28, 1967, Ser. No. 626,495
Int. Cl. G06k *9/06*
U.S. Cl. 340—146.3 **5 Claims**

A pattern recognition digital computer employing stores for combining the addresses of all points on an input matrix that is exposed to a pattern, the addresses being arbitrarily arranged into discrete areas of the stores, at least one predetermined weight value assigned to each of the discrete areas, threshold units for comparing the activity of each of the discrete areas with a predetermined value, response accumulators for receiving the weight values for each of the discrete areas that are above the threshold; and gates, distributors and arithmetic elements for changing the weight values



for those discrete areas that contribute to incorrect responses.

3,581,282
PALM PRINT IDENTIFICATION SYSTEM
Norman G. Altman, White Plains, N.Y., assignor to Charles H. Lipton and Michael Ebert, New York, N.Y., part interest to each
Filed Dec. 3, 1968, Ser. No. 780,768
Int. Cl. G06k *9/00*
U.S. Cl. 340—149 **9 Claims**

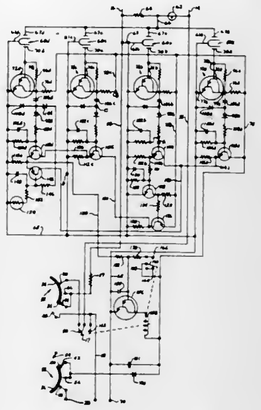


A palm print identification system in which an image of the palm pattern is optically formed and scanned to generate a video signal which is an analog of the pattern, the signal being converted into a numerical code. Because each palm print is unique, an individual is thereby given a singular identifying code number which is an index to the pattern. The code identification may be recorded on an ID card. To verify identification, the hand is placed on a sensing unit and the ID card is inserted in a suitable card reader. The numerical code on the card is sensed and converted into an electrical signal which is compared in a correlator with the video signal derived from the scanned palm of the hand to determine the degree of correspondence therebetween and thereby establish identification.

3,581,283
TONE DECODER RESPONSIVE TO COMBINED TONES
Robert J. Reddel, Fairborn, and Edward J. Brauner, Piqua, both of, Ohio, assignors to Ledex, Inc., Dayton, Ohio
Filed Apr. 30, 1968, Ser. No. 725,469
Int. Cl. H04m *11/02*
U.S. Cl. 340—171 **15 Claims**

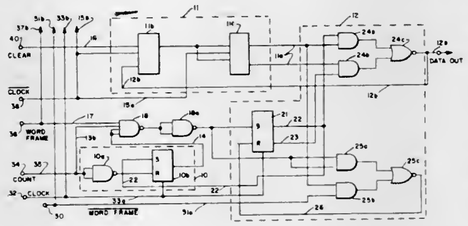
A tone decoder responsive to predetermined combinations of tones presented for predetermined time intervals comprises plural electromechanical tone detector devices coupled to interrelated switchable devices so arranged that an output function will be initiated only when the combination

and time duration of tones presented to the tone detectors satisfies the requirements of the interrelated switchable



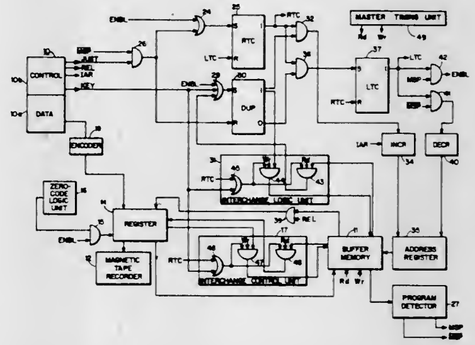
devices so as to permit application of a voltage through the interrelated switchable devices to an output load device.

3,581,284
RANDOMLY ACCESSED NON-INTERFERING INPUT-OUTPUT DATA ACCUMULATOR
Ronald B. Selden, North Hollywood, Calif., assignor to T R W Inc., Redondo Beach, Calif.
Filed June 3, 1968, Ser. No. 734,091
Int. Cl. G06c *25/02*
U.S. Cl. 340—172.5 **5 Claims**



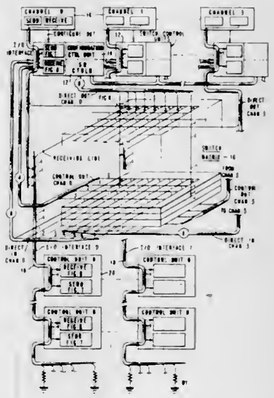
There is disclosed a data accumulator suitable for use in oil field supervisory control systems or, more generally, in various process control or other data processing systems wherein it is desired to accumulate total at the remote location at any time without destroying or interfering with the accumulating total regardless of when the readout command is received. In order to accomplish this, there is provided a shift register adapted to contain the total count data in the form of a binary word having a predetermined number of bits. The shift register is connected in a feedback loop such that its contents may be serially read out and passed through a specialized adding circuit which either transmits the register content in unchanged form or adds one to the total content depending upon whether the adding circuit has been actuated by receipt of an add command from a bistable input buffer means which receives the input unit event counting pulse. The output of the adding circuit is applied as feedback to the input of the shift register in such a fashion that the register content is continuously circulating. The timing parameters of the circuit are chosen so that the total duration of the input unit event count pulse is greater than the total time duration of the complete work content of the shift register. On this basis, the adding circuit logic can be shown to produce a correct and unambiguous result regardless of when the input pulse arrives or when a readout is desired. The online readout is, of course, taken from the adding circuit.

3,581,285
KEYBOARD TO MEMORY PERIPHERAL DEVICE
Farid J. Neema, Sudbury, and Robert C. Engelhardt, Watertown, both of, Mass., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Nov. 20, 1968, Ser. No. 777,442
Int. Cl. G06f *13/00, 3/10*
U.S. Cl. 340—172.5 **12 Claims**



A data recording device is disclosed for entering data into a memory field via a keyboard and for right justifying the entered data in the memory field. The device includes a keyboard with which data is entered, a buffer memory and register that assemble and right justify the data; and a file memory, such as a magnetic tape recorder into which the data is finally recorded. Flag bits stored in the buffer memory, each one associated with a data character, are used for housekeeping purposes to keep track of the location of selected data and to control the right justification sequencing.

3,581,286
MODULE SWITCHING APPARATUS WITH STATUS SENSING AND DYNAMIC SHARING OF MODULES
William F. Beausoleil, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 13, 1969, Ser. No. 790,681
Int. Cl. G06f *15/16*
U.S. Cl. 340—172.5 **17 Claims**



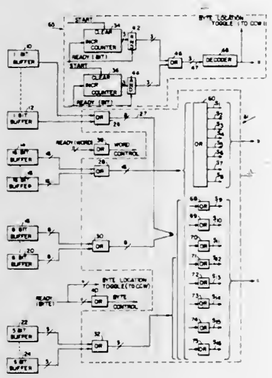
An input/output interface switching apparatus for switching I/O interfaces connecting I/O control units between

channels. The I/O interface switching apparatus provides means for attaching one or more strings of control units to one or more channels and provides a means for switching these strings of control units between the channels under configuration control. The switching apparatus is so arranged that a single failure within one interface affects at most only the channel to which the interface is associated. A switching matrix is provided, within the apparatus, which is physically centralized to minimize the number of I/O interface cables and connectors. The switching functions are, however, logically decentralized from a reliability standpoint so that a single component failure will not result in total switching system failure.

3,581,287
APPARATUS FOR ALTERING COMPUTER MEMORY BY BIT, BYTE OR WORD

Lawrence E. Greenspan, Thorntons Ferry, and Earl J. Whitaker, Nashua, both of, N.H., assignors to Sanders Associates, Inc., Nashue, N.H.

Filed Feb. 10, 1969, Ser. No. 798,034
Int. Cl. G11c *15/00*
U.S. Cl. 340—172.5 **14 Claims**



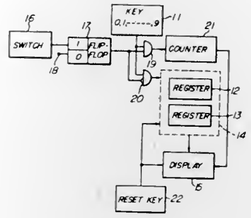
The assembly of individual bits, bytes or words into a 16-bit word is accomplished directly in a computer memory without the use of 16-bit buffer registers in the bit or byte data channels. As a bit, byte or word is received by an input computer channel, that bit, byte or word is stored in the addressed location of the computer memory. In particular, this is accomplished basically by reading the addressed word out of memory into a memory register, gating the new bit or byte into the appropriate stage or stages of the memory register without altering the other stages and writing the new word back into the same memory location.

3,581,288
DATA PROCESSING SYSTEM

Yoshiaki Suzuki, Tokyo, and Toshiharu Inamoto, Yokohama, both of, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 11, 1969, Ser. No. 798,342
Claims priority, application Japan, Feb. 28, 1968, June 4, 1968, 43/13227; 43/47374
Int. Cl. G06f *3/00, 7/38*
U.S. Cl. 340—172.5 **4 Claims**

A data processing system in which an arithmetic operation and the setting of a decimal point are carried out by a command entered from entry digit keys to thereby facilitate the setting of the specified decimal point and the starting of com-

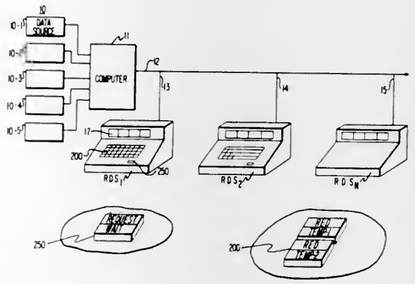


putation and make a contribution to the provision of a simplified device of small size.

3,581,289
DISPLAY TERMINAL FOR COMPUTER MONITORED PLANT VARIABLES

D. F. Wilhelm, Toledo; Peter S. Miller, Toledo; D. L. Bissell, Toledo, and George M. Lambroff, Swanton, all of, Ohio, assignors to Owens-Illinois, Inc.

Filed Apr. 28, 1969, Ser. No. 819,701
Int. Cl. G06f *3/00;* **G06c** *21/00*
U.S. Cl. 340—172.5 **13 Claims**



Input variables are sensed by sensors at various locations in a manufacturing facility and supplied as raw data to a computer which may or may not perform calculations on the data supplied thereto. Data from the computer is presented on a time sharing basis to a plurality of remotely located data display terminals. Each data display terminal is equipped with a plurality of manually actuated data selection units having identifying indicia and a numerical display displaying data from the computer corresponding to the requested indicia of an actuated data selection unit along with data indicating trend of the variable relative to a standard or reference value. The communication link between the computer and the display terminals may be conventional wiring with data lines common to each display terminal and individual lines for achieving connection to the computer and the display terminal being individual to the display terminals. Consult the specification for further features and details.

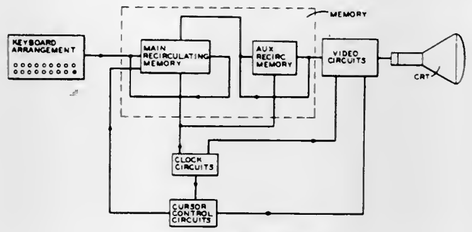
3,581,290
INFORMATION DISPLAY SYSTEM

Robert Sugarman, New York, N.Y., assignor to Sugarman Laboratories, Inc., Great Neck, N.Y.

Filed June 3, 1969, Ser. No. 830,032
Int. Cl. G06f *3/14*
U.S. Cl. 340—172.5 **31 Claims**

A system for the display of information on a cathode-ray tube or the like wherein the information comprises a plurality of lines of text comprising a number of characters and wherein each text line is formed by a plurality of scans. The system comprises a main memory for storing sets of bits

wherein each set of bits represents a different one of all the characters to be displayed and an auxiliary memory for storing the sets of bits comprising the particular text line being formed on the screen of the cathode-ray tube. The auxiliary memory is operable to sequentially present each set of bits



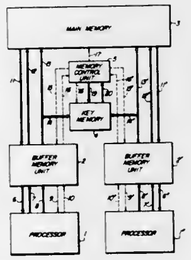
GENERALIZED SYSTEM DIAGRAM

stored therein at its output during each scan comprising the particular text line. Decoding means responsive to the set of bits of the output of the auxiliary memory is provided to modulate the electron beam to form areas of the character represented by the set of bits during a particular scan.

3,581,291
MEMORY CONTROL SYSTEM IN MULTI-PROCESSING SYSTEM

Shoji Iwamoto, Totsuka-ku, and Hisashi Horikoshi, Tachikawa-shi, both of, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 29, 1969, Ser. No. 872,164
Claims priority, application Japan, Oct. 31, 1968, 43/79555
Int. Cl. G06f *15/16*
U.S. Cl. 340—172.5 **13 Claims**



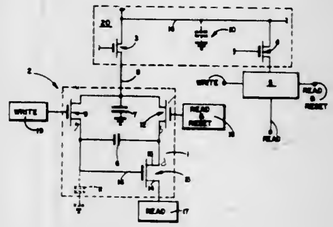
A multiprocessing system comprises two processors and a main memory to be utilized by the processors in common. Each processor is provided with a buffer memory which stores information read from the main memory, block by block, and the main memory is provided with a key memory which stores an indicator indicating whether or not information in the main memory is read out and stored in each processor at each predetermined amount of its capacity (sector). When one of the processors carries out a writing in a sector of the main memory, whether or not the information of the sector is stored in the other processor is checked. When the information is stored, the address of the information is supplied to the other processor to invalidate the corresponding sector of the buffer memory. In this manner, the incoincidence between the stored contents of the main memory and buffer memory is prevented.

3,581,292
READ/WRITE MEMORY CIRCUIT

Robert W. Polkinghorn, Huntington Beach, Calif., assignor to North American Rockwell Corporation

Filed Jan. 7, 1969, Ser. No. 789,455
Int. Cl. G11c *11/24, 7/00*
U.S. Cl. 340—173R **11 Claims**

Two capacitors of an addressed memory circuit are charged during a write period to a potential representing a logical state. The first capacitor is connected between the output electrode and the control electrode of the MOS device for turning the MOS device on as a function of the logical state of the capacitor. When the input signal is true, during a read period, the voltage on the output electrode of the MOS device is fed back through the first capacitor for increasing the voltage. As a result, the output voltage is driven to a voltage which overcomes the threshold drop through the device. Another MOS device having a relatively larger control voltage is turned on so that the read signal appearing at



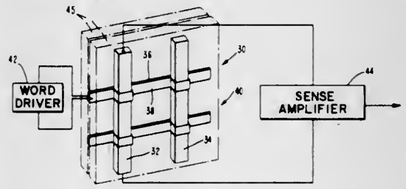
the output electrode of the first MOS device is read out of the address memory circuit without a reduction due to threshold voltages of the MOS devices involved.

The second capacitor connected between the common input/output line and ground is recharged so that it supplies leakage charge to the first capacitor during write periods when the circuit is not addressed. It is conditionally reset to ground between read and write periods to prevent reading of erroneous information.

3,581,293
FORM OF PLATED WIRE MEMORY DEVICE

George A. Fedde, Norristown, and John Presper Eckert, Jr., Gladwyne, both of, Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Continuation of application Ser. No. 241,368, Nov. 30, 1962, now abandoned. This application Nov. 8, 1967, Ser. No. 681,598
Int. Cl. G11c *11/14*
U.S. Cl. 340—174 **9 Claims**



This invention relates to a configuration of a plated wire memory device which permits closer packing of the bits. This is accomplished by using a memory element which has a cross section having a major and minor axis. The forward and return portions of the memory drive which are arranged orthogonally to the plated wire are thereby positioned closer to one another. By reducing the distance (d) between the drive portions, the width (w) thereof can correspondingly be reduced. Reducing (d) and (w) reduces the drive current for a given field strength and for a given amount of interaction between two adjacent drive lines, the distance p can be made smaller.

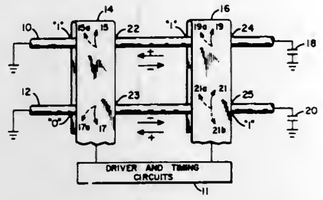
3,581,294
TUNED PLATED WIRE CONTENT ADDRESSABLE MEMORY

William J. Bartik, Wyncote, Pa., assignor to Sperry Rand Corporation, New York, N.Y.

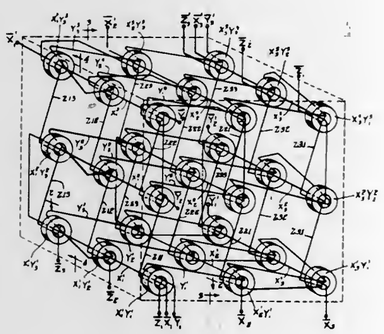
Filed Mar. 11, 1968, Ser. No. 712,108
Int. Cl. G11c *11/14, 15/00*
U.S. Cl. 340—174 **4 Claims**

A wire element is electrically tuned so that it operates with a low impedance. Bit information is then readily transferred

along the wire from one location (sender) to another location (receiver) by energizing the drive strap adjacent the sending bit with a burst of pulses. When the circulating current in the wire builds up to a maximum value, the drive strap adjacent to the receiver bit is energized with a single pulse. The receiver bit will then switch if its binary state is opposite to that of the bit at the transmitter.



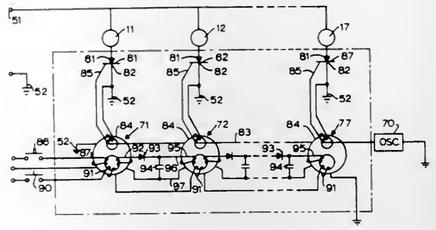
3,581,295
MAGNETIC CORE MEMORY ARRAY
Peter A. Denes, 9101 Crestwood Ave. N.E., Albuquerque, N. Mex.
Division of Ser. No. 352,919, Mar. 18, 1964, Pat. No. 3,435,518.
Filed Jan. 29, 1969, Ser. No. 822,337
Int. Cl. G11c *5/06, 11/06*
U.S. Cl. 340—174NC **8 Claims**



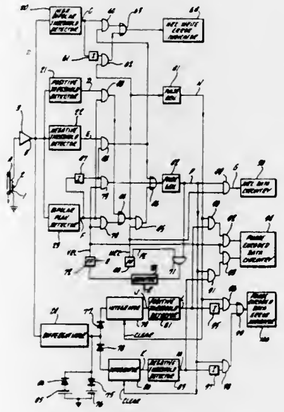
A three-dimensional magnetic core memory system in which the noise effect of partially switched cores on the sensing wires are greatly diminished and the number of connecting points in the system is minimized.

3,581,296
SHIFT REGISTER
William Brooks, 1042 Inverness Way, Sunnyvale, Calif.
Continuation-in-part of application Ser. No. 810,434, Feb. 4, 1969, now Patent No. 3,493,933, which is a division of application Ser. No. 557,148, June 13, 1966, now Patent No. 3,493,957. This application Nov. 17, 1969, Ser. No. 877,069
Int. Cl. G11c *11/08, 19/00;* **H03k** *23/32*
U.S. Cl. 340—174SR **2 Claims**

An electronic shift register used with a source of rectified alternating current, having a positive bus and a ground. A series of shift register stages are serially arranged between a first stage and a last stage, each stage having a silicon controlled rectifier and a transfluxor core associated together. Each silicon controlled rectifier has its cathode connected to ground, and a load is connected between its anode and the positive bus. Each transfluxor has a core and a primary connected to an oscillator and actuated thereby, a secondary connected to the gate of its associated silicon controlled rectifier, and first and second windings; each transfluxor except the one at the last stage has a third winding connected to the second winding of the succeeding stage. A shift control switch is connected in series with each of the first windings, and data input means is connected to the second winding of the first stage for feeding binary data thereto. The connection between each third winding and its successive stage includes a rectifier, and a condenser lies across between the connection and a return line.

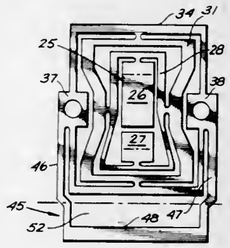


3,581,297
BINARY DATA HANDLING SYSTEM
Michael I. Behr, South Pasadena; Lewis B. Coon, Jr., Pasadena, and Charles E. Bickel, West Covina, all of, Calif., assignors to Burroughs Corporation, Detroit, Mich.
Filed Sept. 18, 1967, Ser. No. 668,529
Int. Cl. G11b *5/02, 5/44*
U.S. Cl. 340—174.1 **9 Claims**



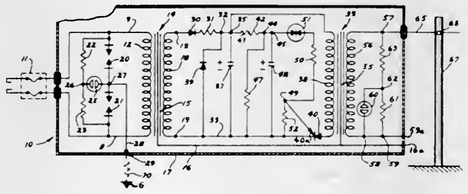
A system for reading binary data recorded on a storage medium as magnetic tape in either of several coding techniques. Specifically, the system is capable of reading either phase encoded data or data recorded in the form of nonreturn-to-zero pulses in which one binary value is represented by a flux reversal in a bit cell and the other binary value is represented by the absence of a flux reversal in a bit cell (hereafter called modified NRZ). A positive threshold detector, a negative threshold detector, and a bipolar peak detector are utilized for recovering the NRZ data and part of the preamble of the phase encoded data. The bipolar peak detector is also employed in the recovery of the phase encoded data itself. To recover the NRZ data and the preamble of the phase encoded data, the output of the positive threshold detector and the bipolar peak detector are combined in one AND circuit and the output of the negative threshold detector and the inverse output of the bipolar peak detector are combined in another AND circuit. To recover the phase encoded data, a signal representing the peak-to-peak amplitude of the read head signal is produced by differentiating it and then separately integrating the two half-cycles of the differential signal. The maximum amplitude of the differentiated signal is limited to suppress noise. The integrated signals are applied to a positive threshold detector and a negative threshold detector, respectively. The output of the positive threshold detector is combined with the output of the bipolar peak detector in one AND circuit and the output of the negative threshold detector is combined with the inverse of the output of the bipolar peak detector in another AND circuit to recover the phase encoded data. To check for errors in the phase encoded data, these outputs are switched and applied to two other AND circuits.

3,581,298
SUPPORT DEVICE FOR MAGNETIC HEAD
Shahbuddin A. Billawala, Thousand Oaks, Calif., assignor to Burroughs Corporation, Detroit, Mich.
Filed Apr. 17, 1969, Ser. No. 816,979
Int. Cl. G11b *5/60;* **F16f** *1/02*
U.S. Cl. 340—174.1 **27 Claims**



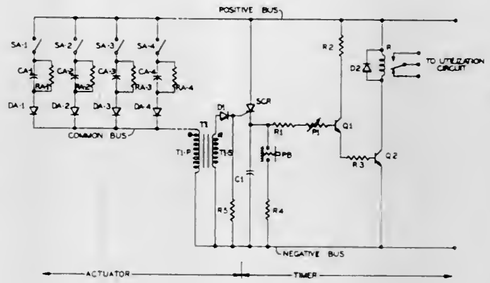
A support device for floating a magnetic head on a fluid atmosphere adjacent a recording surface has several features in a one piece construction. The support device is a substantially flat, thin body structure of elastic material having perforations therein positioned and shaped to form a platform to which a magnetic head is bonded. A portion of the platform is permanently deformed to lie forward of the remainder of the body structure so the magnetic head is spaced from the remainder of the body structure. A pair of mounting tabs extend inwardly from opposite sides of the outer perimeter of the support device. The portions of the support device adjacent to the tabs are bowed inwardly away from the tabs. A cable support bracket is directly joined to the tabs so forces exerted on the bracket do not effect the position of the magnetic head.

3,581,299
ELECTRIC FENCE CHARGER HAVING GROUND DETECTOR
Wilfred W. Schmit, Port Washington, Wis., assignor to Flo-Tronics, Inc., Minneapolis, Minn.
Filed Nov. 19, 1968, Ser. No. 777,040
Int. Cl. G08b *21/00;* **H05c** *1/04;* **A01b** *3/00*
U.S. Cl. 340—254 **10 Claims**



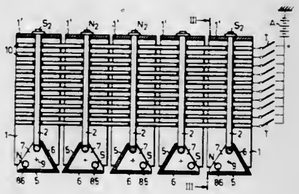
An electric fence charger that is energized from a utility power supply wherein one utility supply line is grounded, said charger having a circuit to provide, in respect to a separate ground connection of said charger, high voltage energy impulses of short duration and a ground detector circuit to provide a visual indication when the fence charger ground does in fact not adequately connect the charger to ground. The ground detector circuit includes a pair of resistors connected in series across the primary winding or a center tapped primary winding of a transformer forming a part of the charger and connected to the utility power supply, and indicating means, such as a neon light, connected between the adjacent ends of said resistors or center tap and the charger ground terminal.

3,581,300
ELECTRONIC ACTUATOR AND TIMER CIRCUIT
Walter G. Eloranta, 1719 Vermont Ave., Fort Wayne, Ind.
Filed July 19, 1968, Ser. No. 746,158
Int. Cl. G08b *23/00*
U.S. Cl. 340—309.1 **4 Claims**



A number of actuator circuits, each having a switch and a capacitor connected in series, are connected to a transformer primary winding. The transformer secondary winding is coupled to a controlled rectifier having a timer capacitor connected to its anode-cathode path. An output circuit is coupled to the timer capacitor. Closing of any one of the switches renders the controlled rectifier conductive to charge the timer capacitor, after which the controlled rectifier is turned off so as to be responsive to closing of another switch. The output circuit produces a signal as long as the timer capacitor has a charge.

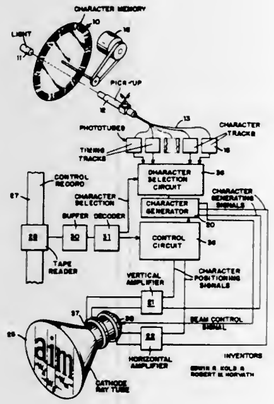
3,581,301
DISPLAY ARRANGEMENT FOR SYMBOLS
Theo Stutz, Bassersdorf, and Werner Mueller, Aarau, both of, Switzerland, assignors to A. G. Contraves, Zurich, Switzerland
Filed Oct. 24, 1967, Ser. No. 677,801
Claims priority, application Switzerland, Oct. 24, 1966, 15399/66
Int. Cl. G09f *9/30*
U.S. Cl. 340—324 **12 Claims**



A display arrangement for displaying any desired symbol in an arbitrary manner in any desired sequence. The display is in the form of a grid pattern in which the grid areas confined by the lines and columns of the grid are either of one visual surface or another visually contrasting surface. The surfaces are flipped from one to the other through the application of a magnetic actuating device. The actuating device supports the visually contrasting surfaces and includes two permanent magnetic discs mounted in a plane perpendicular to the axis of movement or rotation about which the device moves in flipping from one display surface to the other. The permanent magnets operate in conjunction with an electromagnet which generates a field directed through an airgap. When the direction of the magnetic field is in one sense, one of the two permanent magnetic discs is attracted into the airgap while the other is repelled. When the direction of the magnetic field is reversed, the action upon the permanent magnetic discs is correspondingly reversed and the actuating device is moved so as to display the appropriate visual sur-

face. By energizing the electromagnet with current in the proper direction, a particular area within the grid pattern may be made of one or the other contrasting surface and as a result any desired symbol may be displayed.

3,581,302
APPARATUS AND METHOD FOR PROVIDING GRAPHICAL CONFIGURATIONS BY SEQUENTIALLY DIRECTING A RADIANT ENERGY BEAM TO PRESENT IMAGE POSITIONS
Edwin R. Kolb, University Heights, and Robert M. Horvath, Parma, both of, Ohio, assignors to Harris-Intertype Corporation, Cleveland, Ohio
Filed Mar. 4, 1968, Ser. No. 710,349
Int. Cl. H01j *29/70*
U.S. Cl. 340—324 **11 Claims**

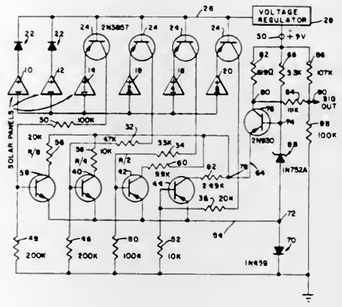


A phototypesetting system employs a cathode-ray tube to present characters of typesetting quality wherein each of the characters displayed is generated by directing the cathode-ray tube beam to a series of locations, each immediately adjacent its previous location, where the beam is energized for a predetermined period of time. A character memory, such as an optically encoded disc, supplies digital information to electronic circuitry which initially locates the beam within a character field and then directs the beam sequentially to additional locations, each of the locations immediately adjacent the previous location, thus forming characters from a series of illuminated spots. Additional deflection signals are supplied to control the cathode-ray tube to move the beam automatically to the next character position after each character has been formed in preparation for the writing of subsequent characters.

3,581,303
DIGITAL TO ANALOG CONVERTER
Franklin G. Kelly, Long Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Oct. 6, 1967, Ser. No. 673,425
Int. Cl. H03k *13/02, 13/04*
U.S. Cl. 340—347 **3 Claims**

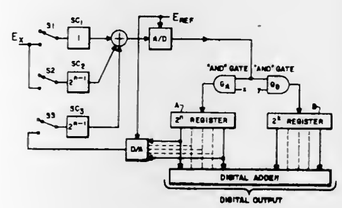
A digital to analog converter includes a plurality of parallel connected circuits, each of which has a switching transistor in series with a calibrating or metering resistor. The metering resistors have resistance values that differ from each other by a multiple of two. The switching transistors each have an input terminal for reception of a digital input signal that switches the transistor on. When a transistor is switched on a current is produced that is proportional to the resistance value of the metering resistor in that particular circuit.

The currents are summed in a summing transistor and a summing resistor that are connected in series with the parallel connected circuits. The summing transistor is provided with means for clamping its emitter voltage on the base thereof. The different currents flowing through the summing transistor and summing resistor produce changes in the voltage across the summing transistor that are compensated by changes in the voltage across the emitter-collector of the



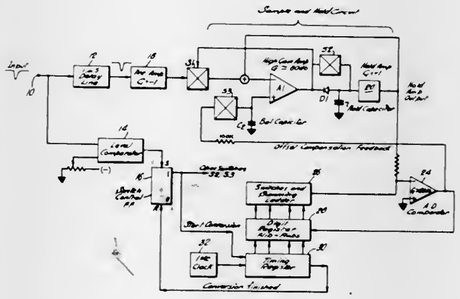
summing transistor, while maintaining constant the voltage across the metering resistors. The voltage across the summing resistor is thereby a function only of the resistance values of the metering resistors.

3,581,304
ANALOG-TO-DIGITAL CYCLIC FORWARD FEED SUCCESSIVE APPROXIMATION CONVERSION EQUIPMENT
Ronald Y. Paradise, Hillsdale; Marvin Masel, W. Englewood; Bob N. Naydan, Oakland, and John D. Brinkman, Pine Brook, all of, N.J., assignors to Singer-General Precision, Inc., Little Falls, N.J.
Filed May 16, 1967, Ser. No. 638,846
Int. Cl. H03k *13/14*
U.S. Cl. 340—347 **2 Claims**



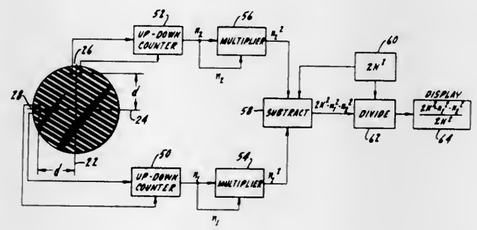
An analog value to be converted to a digital count is first converted into a coarse digital number by applying the analog signal to a ladder network converter which converts the signal into digital form by successive approximation techniques and transfers this digital number to an output register. The value of the number in the register is also reconverted back to analog form by a summing network and subtracted from the original analog signal. The difference between the original and the reconverted values is then amplified by a proper scale factor and again converted to obtain a second digital number in the same converter. The most significant digits of the second digital number are then compared with the corresponding least significant digits of the first number by logic means and the two numbers are then properly consolidated into one number, in a form suitable for use by external equipment, which represents the input analog value with an accuracy higher than that inherent in the analog-to-digital converter being used.

3,581,305
SEQUENTIAL APPROXIMATION PULSE HEIGHT ANALOG-TO-DIGITAL CONVERTER
Donald L. Howlett, Houston, Tex., assignor to Texaco Inc., New York, N.Y.
Filed July 17, 1968, Ser. No. 745,642
Int. Cl. H03k *13/14*
U.S. Cl. 340—347 **5 Claims**



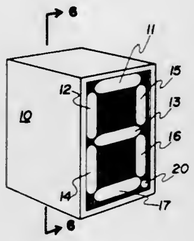
A sequential approximation pulse height analog-to-digital converter including a sample and hold circuit. The converter, including the sample and hold circuit, substantially reduces the "dead time" heretofore required to discharge or step down a capacitor retaining a peak voltage value.

3,581,306
TRIGONOMETRIC ENCODER
Clark E. Johnson, Jr., 60 Pinecroft Road, Weston, Mass.
Continuation-in-part of application Ser. No. 515,895, Dec. 23, 1965, now abandoned. This application Aug. 8, 1969, Ser. No. 848,534
Int. Cl. G08c *9/06*
U.S. Cl. 340—347 **10 Claims**



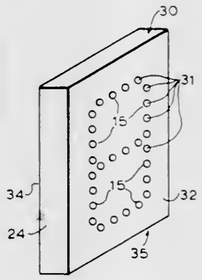
In a trigonometric encoder for providing a digital indication of a trigonometric function of the angle of rotation of a shaft. A rotatable disc, attached to the shaft, whose rotation is to be measured, has alternate lines of differing flux transmissive ability, which lines are parallel with each other and with the diameter of the disc. There are two sources of flux on one side on the disc and two detectors on the opposite side. Each of the detectors is aligned with its source of flux and is arranged to detect the number of times the lines interrupt the flux from the source during rotation of the disc. The number of detected interruptions along with the number of lines are utilized to provide a trigonometric indication of the angle of rotation of the disc.

3,581,307
DIRECT VIEW HIGH INTENSITY READOUT MODULE HAVING CONICAL LIGHT CONVEYOR TUBE
Jack D. McKim, P. O. Box 149, Del Mar, Calif., and Harold W. Ulmer, 2941 San Luis Rey, Oceanside, Calif.
Filed May 29, 1968, Ser. No. 733,156
Int. Cl. G08b *5/36*
U.S. Cl. 340—366 **3 Claims**



A direct view high intensity readout module primarily designed for seven segment digital readout systems in which seven incandescent bulbs are connected to a different pin of a nine terminal vacuum tube base, one of the terminals being common and one of the terminals preferably being coupled for a period indication. A light conveyor tube surrounds each of the incandescent bulbs on one end, the other end forming a segment of the seven segment numerical readout. A heat sink is in physical contact with each of the seven light conveyor tubes. A nonglare frosted face plate is cemented over the segment end of the light conveyor tubes.

3,581,308
LIGHT GUIDE CHARACTER FORMING MASK AND DISPLAY DEVICE CONTROL ELEMENT
Joseph T. McNaney, 8548 Boulder Drive, La Mesa, Calif.
Filed Apr. 11, 1969, Ser. No. 815,374
Int. Cl. G08b *5/00;* **G09f** *9/30*
U.S. Cl. 340—380 **7 Claims**

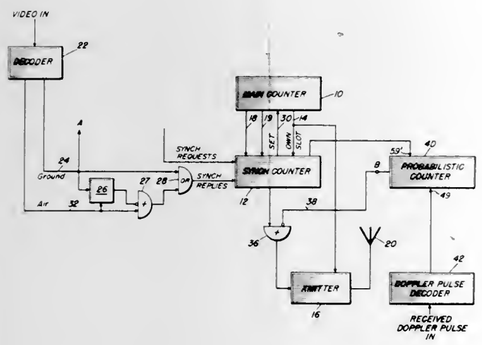


The specification discloses a light guide character forming mask assembly, including means for fashioning such assemblies, and means for utilizing the assembly as a character forming and light control element in various types of light emitting and light gate display devices.

3,581,309
CLOCK SYNCHRONIZATION WITHOUT ADDRESSING FOR COLLISION AVOIDANCE SYSTEMS
Wayne G. Shear, Pompano Beach, Fla.; Merlin E. Olmstead, Baltimore, Md., and Samuel R. Everett, Fort Lauderdale, Fla., assignors to The Bendix Corporation
Filed Sept. 16, 1968, Ser. No. 759,966
Int. Cl. G01s *9/56*
U.S. Cl. 343—6.8 **11 Claims**

A means of synchronizing clocks without addressing within a cooperative collision avoidance system which utilizes the

time slot of the aircraft requesting synchronization. During its time slot, an aircraft transmitting a collision avoidance message automatically requests clock synchronization. All other aircraft within the collision avoidance network which receive the synchronization request will respond in a random manner with a probability inversely proportional to the number of potential responding aircraft within the collision

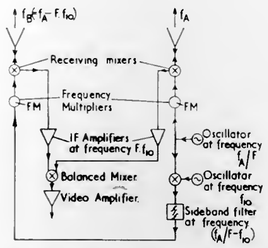


avoidance network. To accomplish this each cooperating aircraft is equipped to monitor the number of occupied time slots so as to determine the number of potential responding aircraft, determines the probability of its response with respect thereto and determines in accordance with the probability thus derived whether it should respond to this particular synchronization request.

3,581,310
RADAR SYSTEMS

Trevor Buckley, Malvern, England, assignor to Frowds Limited, Teddington, England, a part interest
Filed Apr. 9, 1969, Ser. No. 814,529
Claims priority, application Great Britain, Apr. 24, 1968, 19,399/68
Int. Cl. G01s *9/42*
U.S. Cl. 343—7.7 **5 Claims**

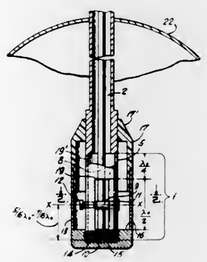
A radar system in which a transmitter and a receiver are located at each of two different sites, the transmitters being operated at different frequencies and some of the power of each transmitter serving as a local oscillator for the receiver which is located on the same site and which receives signals from the other transmitter to provide an intermediate frequency output, the two intermediate frequency outputs being mixed to provide a signal dependent only upon the rate



of change of the total path length between the two sites via a target.

3,581,311
LINEARLY POLARIZED MICROWAVE FEED ASSEMBLY FOR PARABOLIC ANTENNAS AND THE LIKE

Alfred Kach, Untersiggenthal, Switzerland, assignor to Patelhold Patentverwertungs & Elektro-Holding AG, Glarus, Switzerland
Filed Nov. 29, 1968, Ser. No. 780,052
Claims priority, application Switzerland, Dec. 1, 1967, 16921
Int. Cl. H01q *19/14*
U.S. Cl. 343—781 **6 Claims**



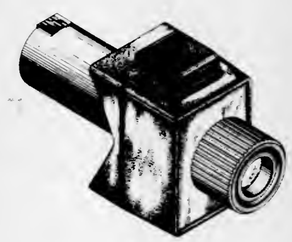
A first coaxial line, short-circuited at one end and propagating a TEM wave, is surrounded by a concentric sleeve of a length approximately equal to half the operating wave length, to provide a second line with the outer conductor of the first line acting as inner conductor of the second line. The latter has one short-circuited end and an annular radiating aperture at its opposite end. The outer conductor of the first line has a pair of diametrically opposed coupling slots with the intervening segments connected, respectively, inductively and capacitatively with the inner conductor of said first line.

DESIGNS

MAY 25, 1971

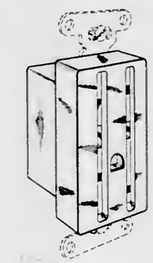
220,792
COMBINED BOTTLE AND STAND THEREFOR
Lee Benson, 5 Horseshoe Lane, Port Chester, N.Y. 10573
Filed Apr. 13, 1970, Ser. No. 22,409
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—13

220,793
FILM STRIP ADAPTER FOR PHOTOGRAPHIC PROJECTOR
Peter T. Quinn, Littleton, Colo., assignor to Honeywell Inc., Minneapolis, Minn.
Filed June 22, 1970, Ser. No. 23,591
Term of patent 14 years
Int. Cl. D16—*04*
U.S. Cl. D61—1



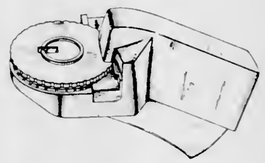
220,794
RADIO RECEIVING SET
Eligah R. Rowry, 236 2-chome, Kajino-cho, Koganei-shi, Tokyo, Japan
Filed Nov. 13, 1969, Ser. No. 20,063
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4

220,795
SINGLE ELECTRICAL OUTLET
Herbert A. Slater, New York, N.Y., assignor to Slater Electric, Inc., Glen Cove, N.Y.
Filed Apr. 13, 1970, Ser. No. 22,380
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—1



220,796
EDUCATIONAL DEVICE
Teruo Matsumoto, Tokyo, Japan, assignor to Epoch Company, Ltd., Tokyo, Japan
Filed July 14, 1970, Ser. No. 23,941
Claims priority, application Japan Mar. 30, 1970
Term of patent 14 years
Int. Cl. D19—*08*
U.S. Cl. D25—1

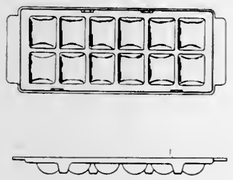
220,797
TAPE EMBOSSING TOOL
William A. Penaluna, Pinole, and Melvin Yee, San Francisco, Calif., assignors to Dymo Industries, Inc., Emeryville, Calif.
Filed Mar. 19, 1970, Ser. No. 21,979
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—10



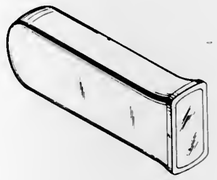
220,798
BOTTLE
Jacques Leonard, 7 Boulevard Richard Wallace, Neuilly-sur-Seine, Hauts-de-Seine, France
Filed May 27, 1969, Ser. No. 17,383
Claims priority, application France Nov. 27, 1968
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—71

220,799
PLATE OR SIMILAR ARTICLE
Johann Martin Stangl, Flemington, N.J., assignor to Stangl Pottery, Trenton, N.J.
Filed Feb. 4, 1970, Ser. No. 21,271
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D44—15

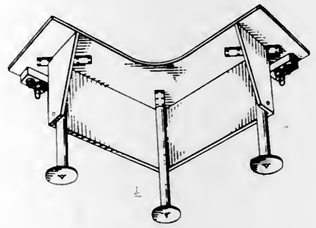
220,800
ICE TRAY
Johannes Christoffel Krogh, 6 Janie St., Walhuter, Johannesburg, Transvaal, Republic of South Africa
Filed Apr. 23, 1970, Ser. No. 22,603
Term of patent 14 years
Int. Cl. D15—*11*
U.S. Cl. D67—3



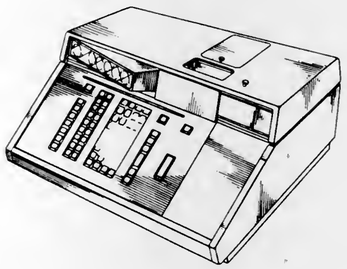
220,801
FLASHLIGHT
Dieter Rams, Koenigstein, Germany, assignor to Braun Aktiengesellschaft, Frankfurt am Main, Germany
Filed Jan. 15, 1969, Ser. No. 15,368
Claims priority, application Germany July 15, 1968
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D48—24



220,802
WORK BENCH
James Hedges and Douglas Frank Edwards, Bracknell, England, assignors to The Barden Corporation (U.K.) Limited, Bracknell, England
Filed Aug. 29, 1969, Ser. No. 18,928
Claims priority, application Great Britain Mar. 11, 1969
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D33—14



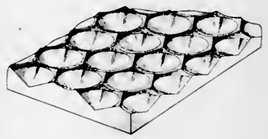
220,803
SALES TERMINAL
Ronald Segall, Los Angeles, Calif., assignor to Scantlin Electronics, Inc., Los Angeles, Calif.
Filed Feb. 20, 1970, Ser. No. 21,552
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



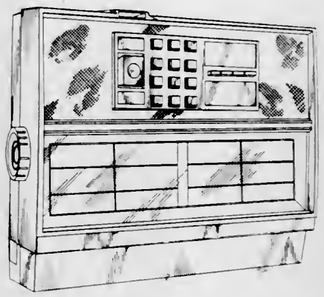
220,804
BUILDING
Danny W. Evins, Lebanon, Tenn., assignor to Consolidated Oil Company, Inc., Lebanon, Tenn.
Filed Jan. 9, 1970, Ser. No. 20,874
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1

220,805
INHALANT DISPENSER
John V. Ryden, Summit, N.J., assignor to Schering Corporation, Bloomfield, N.J.
Filed Dec. 10, 1969, Ser. No. 20,426
Term of patent 14 years
Int. Cl. D24—*05*
U.S. Cl. D83—1

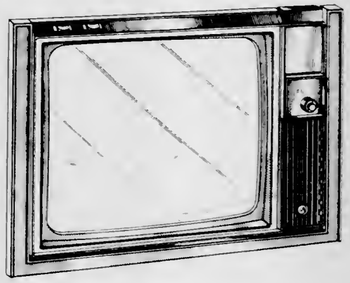
220,806
DIFFUSER FOR A LIGHTING FIXTURE
Richard W. Carroll, Los Angeles, Calif., assignor to U.S. Industries, Inc., New York, N.Y.
Filed Sept. 4, 1969, Ser. No. 19,017
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—16



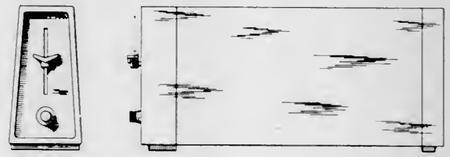
220,807
REMOTE CONTROL UNIT FOR AN AUTOMATIC PHONOGRAPH
Carl W. Sundberg, Bloomfield, Mich., assignor to Walter E. Heller & Company, Chicago, Ill.
Filed Sept. 4, 1969, Ser. No. 19,008
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D26—13



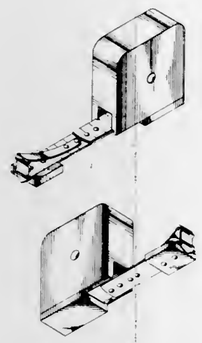
220,808
TELEVISION RECEIVER ESCUTCHEON
Richard K. Althans, Mardan Woods, R.R. 2, Long Grove, Ill. 60047, and Bernard B. Bluestein, 8816A Dee Road, Des Plaines, Ill. 60016
Filed May 27, 1969, Ser. No. 17,377
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4



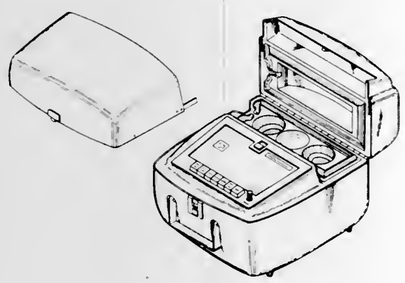
220,809
TOASTER
Don C. Krammes, Canton, Ohio, assignor to The Hoover Company, North Canton, Ohio
Filed Mar. 24, 1970, Ser. No. 22,037
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D81—10



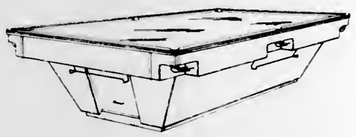
220,810
MAGNETIC MEASURING TAPE
Lloyd J. Le Roue, Rte. 2, P.O. Box 2360, Wapato, Wash. 98951
Filed Nov. 24, 1969, Ser. No. 20,254
Term of patent 14 years
Int. Cl. D10—*08*
U.S. Cl. D52—1



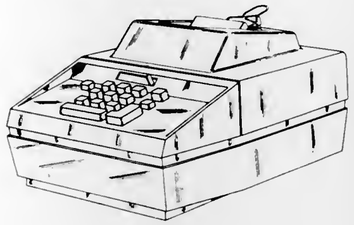
220,811
TELEPHONE COUPLER
Charles Jerabek, Bay Shore, N.Y., assignor to Vernitron Corporation, New York, N.Y.
Filed July 8, 1969, Ser. No. 18,583
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D26—14



220,812
BILLIARD TABLE OR SIMILAR ARTICLE
Jeffrey Frank Harrison, Forton, near Preston, England, assignor to E. J. Riley Limited, Accrington, England
Filed Aug. 11, 1969, Ser. No. 18,640
Claims priority, application Great Britain Dec. 19, 1968
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—3

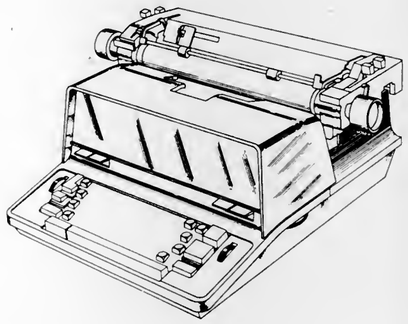


220,813
ADDING MACHINE OR THE LIKE
Carl L. Otto, New York, N.Y., assignor to Litton Business Systems, Inc., New York, N.Y.
Filed Apr. 23, 1970, Ser. No. 22,578
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

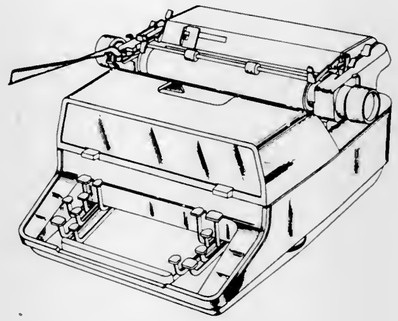


220,814
ADDING MACHINE OR THE LIKE
Carl L. Otto, New York, N.Y., assignor to Litton Business Systems, Inc., New York, N.Y.
Filed Apr. 23, 1970, Ser. No. 22,599
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

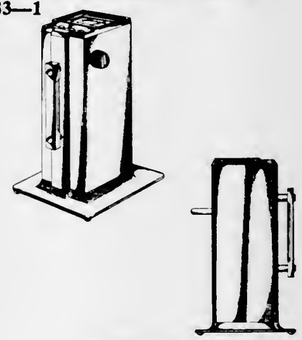
220,815
TYPEWRITER
William B. Sklaroff, Narberth, Pa., assignor to Litton Business Systems, Inc., New York, N.Y.
Filed May 4, 1970, Ser. No. 22,789
Term of patent 14 years
Int. Cl. D18—*02*
U.S. Cl. D64—11



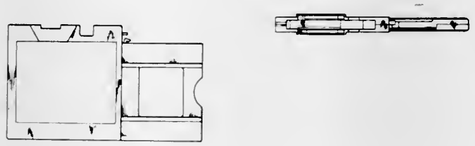
220,816
TYPEWRITER
Joseph L. Morelli, Hartford, Conn., assignor to Litton Business Systems, Inc., New York, N.Y.
Filed Mar. 5, 1970, Ser. No. 21,759
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11



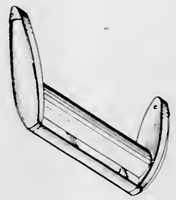
220,817
REFLEX MEASUREMENT APPARATUS
Stephens N. Sato, San Diego, Calif., assignor to Ivac Corporation, San Diego, Calif.
Filed Apr. 14, 1970, Ser. No. 22,423
Term of patent 14 years
Int. Cl. D24—*02*; D10—*08*
U.S. Cl. D83—1



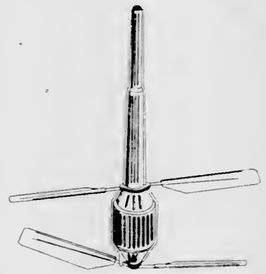
220,818
CASSETTE FOR A SOUND SLIDE PROJECTOR
William Castedello, Plainville, Conn., assignor to The Kalart Company Inc., Plainville, Conn.
Filed Sept. 30, 1969, Ser. No. 19,347
Term of patent 14 years
Int. Cl. D16—*99*; D14—*01*
U.S. Cl. D26—14



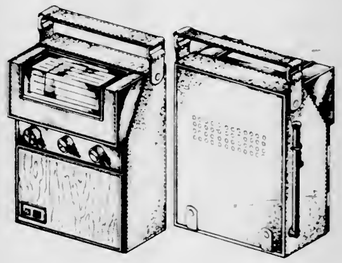
220,819
LUGGAGE HANDLE
Joseph N. Laurita, 66—19 Clinton Ave., Maspeth, N.Y. 11378
Filed May 18, 1970, Ser. No. 23,046
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—154



220,820
ROCKET TOY
Uwe C. Seefluth, Seestrasse, 2409 Klingberg, Germany
Filed Dec. 29, 1969, Ser. No. 20,672
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—15

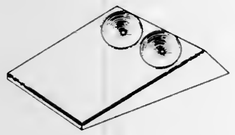


220,821
PORTABLE RADIO
Maurice D. Katz, 35 Broadway, Lawrence, N.Y. 11559
Filed Dec. 3, 1970, Ser. No. 26,272
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D56—4

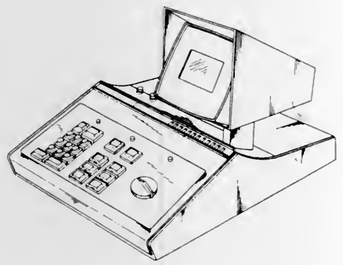


220,822
JACKET
Thomas E. De Wan, 9600 N. Lake Drive, Milwaukee, Wis. 53217
Filed Oct. 6, 1969, Ser. No. 19,439
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—189

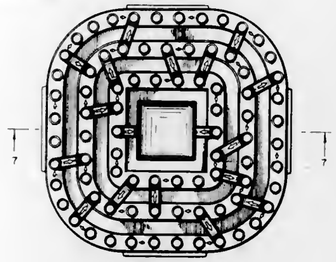
220,823
CONTOURED PILLOW
Robert L. Howe and Norma C. Howe, both of 4581 Parkridge Road, Sacramento, Calif. 95822
Filed Aug. 4, 1969, Ser. No. 18,525
Term of patent 14 years
Int. Cl. D28—*99*
U.S. Cl. D83—1



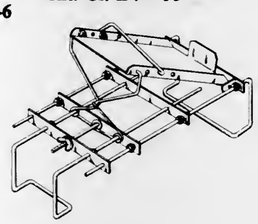
220,824
COMBINED DATA KEYBOARD ENTRY AND DISPLAY UNIT
Gerald M. Adams, Fayetteville, and James H. Frakes, Jr., Manlius, N.N.Y., assignors to SCM Corporation, New York, N.Y.
Filed May 15, 1970, Ser. No. 22,992
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5



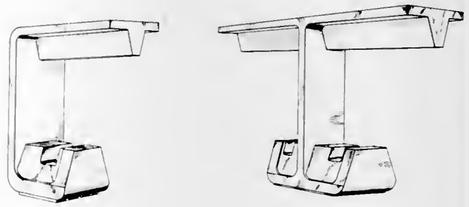
220,825
GAME BOARD
Frank Kohner, New York, N.Y., and Albert Stubbmann, Franklin Lakes, N.J., assignors to Kohner Bros., Inc., East Paterson, N.J.
Filed May 4, 1970, Ser. No. 22,795
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5



220,826
HAND IRON SAFETY CRADLE
Raymond R. Vaughn, 6091 Cornell Drive, Huntington Beach, Calif. 92647
Filed Jan. 6, 1970, Ser. No. 20,775
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D49—6



220,827
SUPPORT FOR A GASOLINE DISPENSER OR THE LIKE
Hal C. Hartsell, Jr., Rte. 9, Evergreen Drive, Winston-Salem, N.C. 27106, and David D. Tompkins, 10350 Olentangy River Road, Worthington, Ohio 43085
Filed Sept. 23, 1969, Ser. No. 19,258
Term of patent 14 years
Int. Cl. D20—*99*
U.S. Cl. D52—2



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF MAY, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abbott Laboratories: *See—*
Crites, Nelson A.; and Lyons, Donald H., 3,580,079.
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Adams, Robert G.: *See—*
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Addressograph-Multigraph Corporation: *See—*
Maul, John A.; Zofchak, James T.; and Anderson, David D., 3,580,169.
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Ehngelsmann, Dieter; Schroder, Rolf; and Becker, Erwin, 3,580,152.
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Shiio, Isamu; Nakamori, Shigeru; and Sano, Kounosuke, 3,580,810.
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Akermanis, Andreys O. Ladder for fruit picker. 3,580,359, Cl. 182-49.
Akst, Harold, to Burroughs Corporatinon. Electrical connection and distribution system. 3,581,268, Cl. 339-18.
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Albertson, Orris E.: *See—*
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Alexander, David C., to International Business Machines Corporation. System for dynamically adjusting clipping in editing electrocardiogram waves. 3,581,219, Cl. 328-168.
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Alexander, Jerry: *See—*
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Alford, Andrew. Directional coupler wherein dielectric media surrounding main line is different from dielectric media surrounding coupled line. 3,581,243, Cl. 333-10.
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Allen, Joseph C.; Bednarski, Valery N.; and Hall, Russell W., Jr., to Texaco Inc. Oil recovery by a combination of solution gas drive and water flooding. 3,580,335, Cl. 166-263.
Allied Chemical Corporation: *See—*
Cheng, Chao-Shing; and Evans, Francis E., 3,580,857.
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Allison, Robert W., Jr.; Brokloff, Robert W.; and Woodyard, John R., to United States of America, Atomic Energy Commission. Method for producing a chromium activated aluminum oxide scintillator. 3,580,822, Cl. 204-58.
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Amano, Hiroshi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic music keyer with touch responsive volume control employing a mechanical-electrical transducer. 3,580,979, Cl. 84-1.1
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AMF Incorporated: *See—*
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Carr, Barney J., deceased0 (by Carr, Elisabeth Helen; administratrix), to Kaman Sciences Corporation, mesne. DC operated positive ion accelerator and neutron generator having an externally available ground potential target. 3,581,093, Cl. 250-84.5
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Zueger, Karl J.; and Decker, Eugene J. Apparatus for inserting stick-like objects into comestible articles. 3,580,456, Cl. 227-100.
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LIST OF REISSUE PATENTEES

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Gingery, Wayne P., to Super-Drive Products, Inc. Dual splined shaft assembly for a clutch. Re. 27,126, 5-25-71, Cl. 192—70.13.

Steel, John F. Means for removing glare of a light beam. Re. 27,125, 5-25-71, Cl. 240—46.11.

LIST OF DESIGN PATENTEES

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Carroll, Richard W., to U.S. Industries, Inc. Diffuser for a lighting fixture. 220,806, 5-25-71, Cl. D48—16.
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Harrison, Jeffrey F., to E. J. Riley Ltd. Billiard table or similar article. 220,812, 5-25-71, Cl. D34—3.
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Kalart Co. Inc., The: *See*—
Castedello, William. 220,818.
Katz, Maurice D. Portable radio. 220,821, 5-25-71. Cl. D56—4.
Kohner Bros., Inc.: *See*—
Kohner, Frank, and Stubbmann. 220,825.
Kohner, Frank, and A. Stubbmann, to Kohner Bros., Inc. Game board. 220,825, 5-25-71, Cl. D34—5.
Krammes, Don C., to The Hoover Co. Toaster. 220,809, 5-25-71, Cl. D81—10.
Krogh, Johannes C. Ice tray. 220,800, 5-25-71. Cl. D6—3.
Laurita, Joseph N. Luggage handle. 220,819, 5-25-71. Cl. D8—154.
Leonard, Jacques. Bottle. 220,798, 5-25-71, Cl. D9—71.
Le Roue, Lloyd J. Magnetic measuring tape. 220,810, 5-25-71, Cl. D52—1.
Litton Business Systems, Inc.: *See*—
Otto, Carl L. 220,813.
Otto, Carl L. 220,814.
Sklaroff, William B. 220,815.
Morelli, Joseph L. 220,816.
Misumoto, Teruo, to Epoch Co., Ltd. Educational device. 220,796, 5-25-71, Cl. D25—1.
Morelli, Joseph L., to Litton Business Systems, Inc. Typewriter. 220,816, 5-25-71, Cl. D64—11.
Otto, Carl L., to Litton Business Systems, Inc. Adding machine or the like. 220,813, 5-25-71, Cl. D64—11.
Otto, Carl L., to Litton Business Systems, Inc. Adding machine or the like. 220,814, 5-25-71, Cl. D64—11 .
Penaluna, William A., and M. Yee, to Dymo Industries, Inc. 220,797, 5-25-71, Cl. D64—10.
Quinn, Peter T., to Honeywell, Inc. Film strip adapter for photographic projector. 220,793, 5-25-71, Cl. D61—1.
Rams, Dieter, to Braun Aktiengesellschaft. Flashlight. 220,801, 5-25-71, Cl. D48—24.
Riley, E. J., Ltd.: *See*—
Harrison, Jeffrey F. 220,812.
Rowry, Eligah R. Radio receiving set. 220,794, 5-25-71, Cl. D56—4.
Ryden, John V., to Schering Corp. Inhalant dispenser. 220,805, 5-25-71, Cl. D83—1.
SCM Corp.: *See*—
Adams, Gerald M., and Frakes. 220,824.
Sato, Stephens N., to Invac Corp. Reflex measurement apparatus. 220,817, 5-25-71, Cl. R83—1.
Seefluth, Uwe C. Rocket toy. 220,820, 5-25-71, Cl. D34—15.
Scantlin Electronics, Inc.: *See*—
Segall, Ronald. 220,803.
Schering Corp.: *See*—
Ryden, John V. 220,805.
Segall, Ronald, to Scantlin Electronics, Inc. Sales terminal. 220,803, 5-25-71, Cl. D26—5.
Sklaroff, William B., to Litton Business Systems, Inc. Typewriter. 220,815, 5-25-71, Cl. D64—11.
Stangl, Johann M., to Stangl Pottery. Plate or similar article. 220,799, 5-25-71, Cl. D44—15.
Stangl Pottery: *See*—
Stangl, Johann M. 220,799.
Slater Electric, Inc.: *See*—
Slater, Herbert A. 220,795.
Slater, Herbert A., to Slater Electric, Inc. Single electrical outlet. 220,795, 5-25-71, Cl. D26—1.
Stubbmann, Albert: *See*—
Kohner, Frank, and Stubbmann. 220,825.
Sundberg, Carl W., to Walter E. Heller & Co. Remote control unit for an automatic phonograph. 220,807, 5-25-71, Cl. D26—13.
Tompkins, David D.: *See*—
Hartsell, Hal C., Jr., and Tompkins. 220,827.
U.S. Industries, Inc.: *See*—
Carroll, Richard W. 220,806.
Vaughn, Raymond R. Hand iron safety cradle. 220,826, 5-25-71, Cl. D49—6.
Vernitron Corp.: *See*—
Jerabek, Charles. 220,811.
Yee, Melvin: *See*—
Penaluna, William A., and Yee. 220,797.

CLASSIFICATION OF PATENTS

ISSUED MAY 25, 1971

NOTE.—First number, class; second number, subclass; third number, patent number

2– 3	3,579,637	
8	3,579,638	
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252	3,579,670	
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81	3,579,672	
94	3,579,673	
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87	3,579,686	
129	3,579,687	
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361	3,579,699	
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114	3,579,711	
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36	3,579,743	
19– 97.5	3,579,744	
23– 2	3,580,702	
122	3,580,703	
230	3,580,704	
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205.1	3,579,748	
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447	3,579,805	
463	3,579,806	
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497.5	3,579,808	
509	3,579,809	
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596	3,579,818	
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93	3,579,826	
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19	3,579,838	
46	3,579,839	
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180	3,579,844	
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48	3,579,849	
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309	3,579,937	
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112	3,579,945	
138	3,579,955	
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390	3,579,961	
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243	3,580,035	
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255	3,580,037	
264	3,580,038	
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324	3,580,040	
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402	3,580,043	
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344	3,580,078	
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406	3,580,082	
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90– 11	3,580,133	
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277	3,580,138	
411	3,580,139	
92– 25	3,580,140	
93– 8	3,580,141	
33	3,580,142	
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93	3,580,145	
94	3,580,146	
94– 50	3,580,147	
95– 10	3,580,148	
11	3,580,149	
12.20	3,580,151	
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60	3,580,156	
64	3,580,157	

LIST OF REISSUE PATENTEES

TO WHOM

MAY 25, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Gingery, Wayne P., to Super-Drive Products, Inc. Dual splined shaft assembly for a clutch. Re. 27,126, 5-25-71, Cl. 192—70.13.

Steel, John F. Means for removing glare of a light beam. Re. 27,125, 5-25-71, Cl. 240—46.11.

LIST OF DESIGN PATENTEES

Adams, Gerlad M., and J. H. Frakes, Jr., to SCM Corp. Combined data keyboard entry and display unit. 220,824, 5-25-71, Cl. D26—5.
Althans, Richard K., and B. B. Gluestein. Television receiver escutcheon. 220,808, 5-25-71, Cl. D56—4.
Barden Corp., The: *See*—
Hedges, James E. 220,802.
Benson, Lee. Combined bottle and stand therefor. 220,792, 5-25-71, Cl. D9—18.
Bluestein, Bernard B.: *See*—
Althans, Richard K., and Bluestein. 220,808.
Braun Aktiengesellschaft: *See*—
Rams, Dieter. 220,801.
Carroll, Richard W., to U.S. Industries, Inc. Diffuser for a lighting fixture. 220,806, 5-25-71, Cl. D48—16.
Castedello, William, to The Kalart Co., Inc. Cassette for a sound slide projector. 220,818, 5-25-71. Cl. D26—14.
Consolidated Oil Co.: *See*—
Evins, Danny W. 220,804.
De Wan, Thomas E. Jacket. 220,822, 5-25-71, Cl. D2—189.
Dymo Industries, Inc.: *See*—
Penaluna, William A., and Yee. 220,797.
Edwards, Douglas F.: *See*—
Hedges, James, and Edwards. 220,802.
Epoch Co., Ltd.: *See*—
Matsumoto, Teruo. 220,796.
Evins, Danny W., to Consolidated Oil Co., Inc. Building. 220,804, 5-25-71. Cl. D13—1.
Frakes, James H., Jr.: *See*—
Adams, Gerald M., and Frakes. 220,824.
Harrison, Jeffrey F., to E. J. Riley Ltd. Billiard table or similar article. 220,812, 5-25-71, Cl. D34—3.
Hartsell, Hal C., Jr., and D. D. Tompkins. Support for a gasoline dispenser or the like. 220,827, 5-25-71, Cl. D52—2.
Hedges, James, and D. F. Edwards, to The Barden Corp. Work bench. 220,802, 5-25-71, Cl. D33—14.
Heller, Walter E., & Co.: *See*—
Sundberg, Carl W. 220,807.
Honeywell Inc.: *See*—
Quinn, Peter T. 220,793.
Hoover Co., The: *See*—
Krammes, Don C. 220,809.
Howe, Robert L., and N. C. Howe. Contoured pillow. 220,823, 5-25-71. Cl. D83—1.
Ivac Corp.: *See*—
Sato, Stephens N. 220,817.
Jerabek, Charles, to Vernitron Corp. Telephone coupler. 220,811, 5-25-71, Cl. D26—14.
Kalart Co. Inc., The: *See*—
Castedello, William. 220,818.
Katz, Maurice D. Portable radio. 220,821, 5-25-71. Cl. D56—4.
Kohner Bros., Inc.: *See*—
Kohner, Frank, and Stubbmann. 220,825.
Kohner, Frank, and A. Stubbmann, to Kohner Bros., Inc. Game board. 220,825, 5-25-71, Cl. D34—5.
Krammes, Don C., to The Hoover Co. Toaster. 220,809, 5-25-71, Cl. D81—10.
Krogh, Johannes C. Ice tray. 220,800, 5-25-71. Cl. D6—3.
Laurita, Joseph N. Luggage handle. 220,819, 5-25-71, Cl. D8—154.
Leonard, Jacques. Bottle. 220,798, 5-25-71, Cl. D9—71.
Le Roue, Lloyd J. Magnetic measuring tape. 220,810, 5-25-71, Cl. D52—1.

Litton Business Systems, Inc.: *See*—
Otto, Carl L. 220,813.
Otto, Carl L. 220,814.
Sklaroff, William B. 220,815.
Morelli, Joseph L. 220,816.
Misumoto, Teruo, to Epoch Co., Ltd. Educational device. 220,796, 5-25-71, Cl. D25—1.
Morelli, Joseph L., to Litton Business Systems, Inc. Typewriter. 220,816, 5-25-71, Cl. D64—11.
Otto, Carl L., to Litton Business Systems, Inc. Adding machine or the like. 220,813, 5-25-71, Cl. D64—11.
Otto, Carl L., to Litton Business Systems, Inc. Adding machine or the like. 220,814, 5-25-71, Cl. D64—11 .
Penaluna, William A., and M. Yee, to Dymo Industries, Inc. 220,797, 5-25-71, Cl. D64—10.
Quinn, Peter T., to Honeywell, Inc. Film strip adapter for photographic projector. 220,793, 5-25-71, Cl. D61—1.
Rams, Dieter, to Braun Aktiengesellschaft. Flashlight. 220,801, 5-25-71, Cl. D48—24.
Riley, E. J., Ltd.: *See*—
Harrison, Jeffrey F. 220,812.
Rowry, Eligah R. Radio receiving set. 220,794, 5-25-71, Cl. D56—4.
Ryden, John V., to Schering Corp. Inhalant dispenser. 220,805, 5-25-71, Cl. D83—1.
SCM Corp.: *See*—
Adams, Gerald M., and Frakes. 220,824.
Sato, Stephens N., to Invac Corp. Reflex measurement apparatus. 220,817, 5-25-71, Cl. RS3—1.
Seefluth, Uwe C. Rocket toy. 220,820, 5-25-71, Cl. D34—15.
Scantlin Electronics, Inc.: *See*—
Segall, Ronald. 220,803.
Schering Corp.: *See*—
Ryden, John V. 220,805.
Segall, Ronald, to Scantlin Electronics, Inc. Sales terminal. 220,803, 5-25-71, Cl. D26—5.
Sklaroff, William B., to Litton Business Systems, Inc. Typewriter. 220,815, 5-25-71, Cl. D64—11.
Stangl, Johann M., to Stangl Pottery. Plate or similar article. 220,799, 5-25-71, Cl. D44—15.
Stangl Pottery: *See*—
Stangl, Johann M. 220,799.
Slater Electric, Inc.: *See*—
Slater, Herbert A. 220,795.
Slater, Herbert A., to Slater Electric, Inc. Single electrical outlet. 220,795, 5-25-71, Cl. D26—1.
Stubbmann, Albert: *See*—
Kohner, Frank, and Stubbmann. 220,825.
Sundberg, Carl W., to Walter E. Heller & Co. Remote control unit for an automatic phonograph. 220,807, 5-25-71, Cl. D26—13.
Tompkins, David D.: *See*—
Hartsell, Hal C., Jr., and Tompkins. 220,827.
U.S. Industries, Inc.: *See*—
Carroll, Richard W. 220,806.
Vaughn, Raymond R. Hand iron safety cradle. 220,826, 5-25-71, Cl. D49—6.
Vernitron Corp.: *See*—
Jerabek, Charles. 220,811.
Yee, Melvin: *See*—
Penaluna, William A., and Yee. 220,797.

CLASSIFICATION OF PATENTS

ISSUED MAY 25, 1971

NOTE.—First number, class; second number, subclass; third number, patent number

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	8	3,579,638
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